

Access DB# 121978**SEARCH REQUEST FORM**

Scientific and Technical Information Center

Requester's Full Name: LEE, RUP A. Examiner #: 78680 Date: MAY 13, 2004  
Art Unit: 1743 Phone Number 301 571-272-1104 Serial Number: 09/883,275  
Mail Box and Bldg/Room Location: REM 10A24 Results Format Preferred (circle): PAPER DISK E-MAIL

**If more than one search is submitted, please prioritize searches in order of need.**

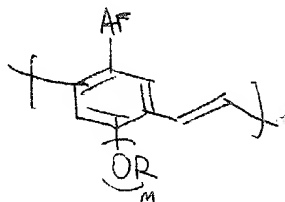
\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: POLYMERIC FLUORESCENT SUBSTANCE & POLYMER LIGHT-EMITTING DEVICEInventors (please provide full names): YAMAZAKI, MichioDOI, ShujiEarliest Priority Filing Date: JUNE 22, 2000 /

*\*For Sequence Searches Only\** Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

Please search for polymers containing the fragment



Ar = aryl containing group, must  
be directly bonded to phenylene backbone  
aromatic portion

R = generally alkyl  
m = 1+

Keywords: polyarylene vinylene  
polyphenylene vinylene (PPV)  
aryl-substituted

\*\*\*\*\*  
**STAFF USE ONLY**

	Type of Search	Vendors and cost where applicable
Searcher: _____	NA Sequence (#) _____	STN _____
Searcher Phone #: _____	AA Sequence (#) _____	Dialog _____
Searcher Location: _____	Structure (#) _____	Questel/Orbit _____
Date Searcher Picked Up: _____	Bibliographic, _____	Dr. Link _____
Date Completed: _____	Litigation _____	Lexis/Nexis _____
Searcher Prep & Review Time: _____	Fulltext _____	Sequence Systems _____
Clerical Prep Time: _____	Patent Family _____	WWW/Internet _____
Online Time: _____	Other _____	Other (specify) _____



# STIC Search Report

## EIC 1700

STIC Database Tracking Number: 121978

TO: Rip A Lee  
Location: *Rem 10A24*  
Art Unit : 1743  
May 19, 2004

Case Serial Number: 09/883275

From: Barba Koroma  
Location: EIC 1700  
REM EO4 A30  
Phone: 571 272 2546

[barba.koroma@uspto.gov](mailto:barba.koroma@uspto.gov)

### Search Notes

Examiner Lee,

Please find attached results of the search you requested. Various components of the invention as spelt out in the claims and search request were searched in REGISTRY and CAPLUS databases.

For your convenience, titles of hits have been listed to help you peruse the results set quickly. This is followed by a detailed printout of records. Please let me know if you have any questions.

Thanks.



# STIC Search Results Feedback Form

**EIC17000**

Questions about the scope or the results of the search? Contact *the EIC searcher* or contact:

Kathleen Fuller, EIC 1700 Team Leader  
571/272-2505 REMSEN 4B28

## Voluntary Results Feedback Form

- I am an examiner in Workgroup:  Example: 1713  
➤ Relevant prior art **found**, search results used as follows:

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited as being of interest.
- ☐ Helped examiner better understand the invention.
- ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature  
(journal articles, conference proceedings, new product announcements etc.)

➤ Relevant prior art **not found**:

- ☐ Results verified the lack of relevant prior art (helped determine patentability).
- ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to EIC1700 REMSEN 4B28



=> file reg

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Property values tagged with IC are from the ZIC/VINITI data file  
provided by InfoChem.

STRUCTURE FILE UPDATES: 18 MAY 2004 HIGHEST RN 683203-75-0  
DICTIONARY FILE UPDATES: 18 MAY 2004 HIGHEST RN 683203-75-0

TSCA INFORMATION NOW CURRENT THROUGH JANUARY 6, 2004

Please note that search-term pricing does apply when  
conducting SmartSELECT searches.

Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. For more  
information enter HELP PROP at an arrow prompt in the file or refer  
to the file summary sheet on the web at:  
<http://www.cas.org/ONLINE/DBSS/registryss.html>

=> file caplus

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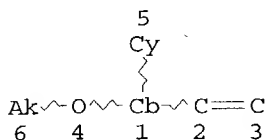
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FILE COVERS 1907 - 19 May 2004 VOL 140 ISS 21  
FILE LAST UPDATED: 18 May 2004 (20040518/ED)

This file contains CAS Registry Numbers for easy and accurate  
substance identification.

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L1 STR



NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

GGCAT IS MCY UNS AT 1

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 6

STEREO ATTRIBUTES: NONE

L2 SCR 2043

L4 58 SEA FILE=REGISTRY SSS FUL L1 AND L2

L5 49 SEA FILE=CAPLUS ABB=ON PLU=ON L4

L6 21 SEA FILE=CAPLUS ABB=ON PLU=ON L5 AND (POLYM?(4A) (EL OR  
FLUORESC? OR LIGHT?(4A) (EMIT? OR EMISS?) OR PHOSPHORESCENCE OR  
ELECTROLUMINESC? OR LUMINESC?))

=> d ti 1-21

L6 ANSWER 1 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN

TI Poly(silanylenediethynylarylenes) for positive hole-transporting materials  
in organic electroluminescent devices

L6 ANSWER 2 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN

TI Synthesis and Characterization of New Red-Emitting Polyfluorene  
Derivatives Containing Electron-Deficient 2-Pyran-4-ylidene-Malononitrile  
Moieties

L6 ANSWER 3 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN

TI Field-dependent properties of electroluminescent devices based on  
DCM-doped poly(p-phenylene vinylene) derivatives

L6 ANSWER 4 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN

TI Efficient blue light-emission from new soluble, PPV-analogous with  
meta-linkage biphenyl moieties

L6 ANSWER 5 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN

TI Blue light-emitting poly(p-phenylenevinylene) derivatives containing  
alternating conjugated segments and aliphatic spacers

L6 ANSWER 6 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN

TI Luminescent block copolymers with conjugated bonds

- L6 ANSWER 7 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
TI New family of polyfluorene copolymers for light emitting devices
- L6 ANSWER 8 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Mechanism of one- and two-photon absorption induced photoluminescence in PPV type, **electroluminescent polymer**
- L6 ANSWER 9 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Synthesis and Luminescent Studies of Poly(phenylenevinylene)s Containing a Biphenyl Moiety
- L6 ANSWER 10 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Synthesis and electroluminescence properties of ortho-, meta- and para-linked polymers containing oxadiazole unit
- L6 ANSWER 11 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
TI **Polymeric fluorescent substance and polymer light emitting device**
- L6 ANSWER 12 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Poly[(p-phenylene vinylene)-alt-(2,2'-biphenylene vinylene)]s: new conjugated polymers with high solid state photoluminescence quantum efficiencies
- L6 ANSWER 13 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
TI New soluble **light-emitting diode polymer** containing oxadiazole unit
- L6 ANSWER 14 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
TI A New Electron-withdrawing Group Containing Poly(1,4-phenylenevinylene)
- L6 ANSWER 15 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Enhanced **electroluminescence** from single-layer **polymer light-emitting devices**
- L6 ANSWER 16 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Blue **light-emitting devices** based on novel **polymer blends**
- L6 ANSWER 17 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Electric field-induced fluorescence quenching and transient fluorescence studies in poly(p-terphenylene vinylene) related polymers
- L6 ANSWER 18 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Influence of silicon atoms on the  $\pi$ -conjugation in **electroluminescent polymers**
- L6 ANSWER 19 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Narrow-band emissions from conjugated-polymer films
- L6 ANSWER 20 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Preparation and use of electroluminescent oligo(p-phenylenevinylenes)

L6 ANSWER 21 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
 TI The Optical, Electronic, and Electroluminescent Properties of Novel  
 Poly(p-phenylene)-Related Polymers

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L6 ANSWER 1 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2004:17971 CAPLUS  
 DOCUMENT NUMBER: 140:67421  
 TITLE: Poly(silanylenediethynylarylenes) for positive  
 hole-transporting materials in organic  
 electroluminescent devices  
 INVENTOR(S): Oshita, Joji; Kunai, Atsuaki  
 PATENT ASSIGNEE(S): Tokuyama Corp., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 28 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004002806	A2	20040108	JP 2003-107283	20030411

PRIORITY APPLN. INFO.: JP 2002-111534 A 20020415

AB The polymers are represented by [C.tplbond.CArC.tplbond.C(SiR1R2)n] [Ar = C15-100 arylene,  $\pi$ -excess C3-100 heteroarylene having N-containing ring,  $\pi$ -excess C8-100 heteroarylene free of N in ring, defined styrylene, defined phenylenevinylene; R1, R2 = alkyl, aryl, heteroaryl; n = 1-10] and have weight-average mol. weight 300-100,000. The polymers show stable **light-emitting** characteristics at high temperature

IT 637356-31-1P  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (poly(silanylenediethynylarylenes) for pos. hole-transporting materials in organic electroluminescent devices)

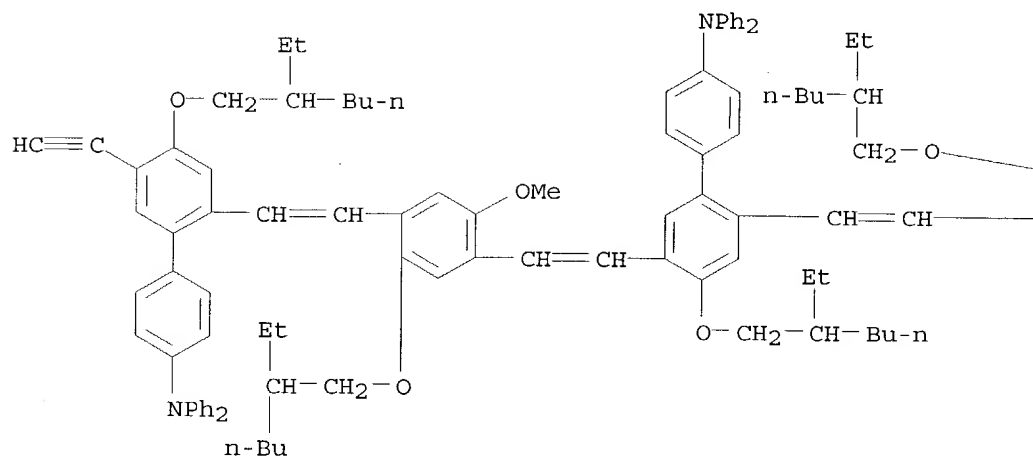
RN 637356-31-1 CAPLUS

CN [1,1'-Biphenyl]-4-amine, 2'-[2-[4-[2-[6-[2-[4-(1-buten-3-yn-1-yl)-2-[(2-ethylhexyl)oxy]-5-methoxyphenyl]ethenyl]-4'-(diphenylamino)-4-[(2-ethylhexyl)oxy][1,1'-biphenyl]-3-yl]ethenyl]-2-[(2-ethylhexyl)oxy]-5-methoxyphenyl]ethenyl]-5'-[2-[4-[2-[4'-(diphenylamino)-4-[(2-ethylhexyl)oxy]-5-ethynyl[1,1'-biphenyl]-2-yl]ethenyl]-5-[(2-ethylhexyl)oxy]-2-methoxyphenyl]ethenyl]-4'-[(2-ethylhexyl)oxy]-N,N-diphenyl-, polymer with 1,6-dichloro-1,1,2,2,3,3,4,4,5,5,6,6-dodecaphenylhexasilane (9CI) (CA INDEX NAME)

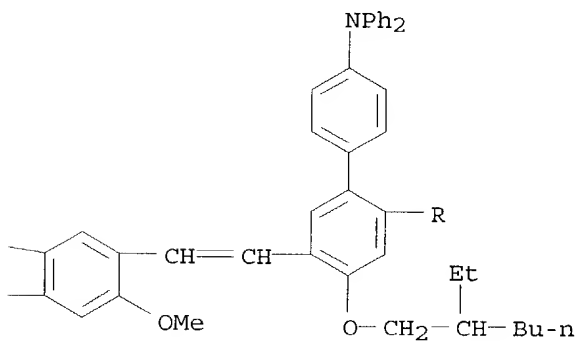
CM 1

CRN 637356-30-0  
 CMF C157 H179 N3 O9

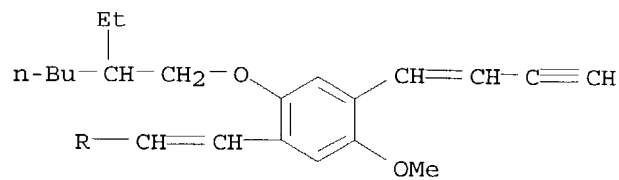
PAGE 1-A



PAGE 1-B



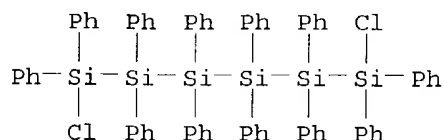
PAGE 2-A



CM 2



CRN 1264-79-5  
CMF C72 H60 Cl2 Si6



- IC ICM C08G077-60  
ICS H05B033-14; H05B033-22
- CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
Section cross-reference(s): 37
- ST electroluminescent device pos hole transporting material  
polysilanylenediethynylarylene
- IT Electroluminescent devices  
Hole transport  
(poly(silanylenediethynylarylenes) for pos. hole-transporting materials in organic electroluminescent devices)
- IT Cardo polymers  
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(poly(silanylenediethynylarylenes) for pos. hole-transporting materials in organic electroluminescent devices)
- IT Polycarbosilanes  
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(polyacetylene-, polyarylene-, poly(silanylenediethynylarylenes) for pos. hole-transporting materials in organic electroluminescent devices)
- IT Polyacetylenes, uses  
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(polycarbosilane-, polyarylene-, poly(silanylenediethynylarylenes) for pos. hole-transporting materials in organic electroluminescent devices)
- IT 637356-20-8P 637356-20-8P 637356-42-4P 637356-43-5P  
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(cardo; poly(silanylenediethynylarylenes) for pos. hole-transporting materials in organic electroluminescent devices)
- IT 605668-16-4P, Diethyldichlorosilane-1,6-diethynylpyrene copolymer  
605668-18-6P 637356-09-3P, Dimethyldichlorosilane-1,6-diethynylpyrene copolymer 637356-10-6P 637356-34-4P 637356-35-5P  
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(poly(silanylenediethynylarylenes) for pos. hole-transporting materials in organic electroluminescent devices)
- IT 637356-11-7P, 1,2-Dichlorotetraethyldisilane-1,6-diethynylpyrene copolymer  
637356-12-8P 637356-13-9P 637356-14-0P 637356-17-3P 637356-18-4P

637356-24-2P 637356-25-3P 637356-28-6P 637356-29-7P  
**637356-31-1P** 637356-33-3P 637356-36-6P 637356-37-7P  
 637356-38-8P 637356-39-9P 637356-40-2P 637356-41-3P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(poly(silanylenediethynylarylenes) for pos. hole-transporting materials in organic electroluminescent devices)

L6 ANSWER 2 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2003:946278 CAPLUS

DOCUMENT NUMBER: 140:128768

TITLE: Synthesis and Characterization of New Red-Emitting Polyfluorene Derivatives Containing Electron-Deficient 2-Pyran-4-ylidene-Malononitrile Moieties

AUTHOR(S): Peng, Qiang; Lu, Zhi-Yun; Huang, Yan; Xie, Ming-Gui;

CORPORATE SOURCE: Han, Shao-Hu; Peng, Jun-Biao; Cao, Yong; Huang, Wei  
 Department of Chemistry, Sichuan University, Chengdu, 610064, Peop. Rep. China

SOURCE: Macromolecules (2004), 37(2), 260-266

CODEN: MAMOBX; ISSN: 0024-9297

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A novel series of red-light-emitting copolymers derived from fluorene and 2-pyran-4-ylidene-malononitrile (PM) have been synthesized through a palladium-catalyzed Suzuki coupling reaction. The polymers were characterized by FT-IR, NMR, and elemental anal. All these polymers are completely soluble in common organic solvents, such as THF, CH<sub>2</sub>Cl<sub>2</sub>, CHCl<sub>3</sub>, and toluene, and they have good thermal stability with onset decomposition temperature

(Td) of 406-407 °C and glass-transition temperature (Tg) of 73-186°. Cyclic voltammetry studies reveal that these copolymers have low-lying LUMO energy levels ranging from -3.53 to -3.57 eV and HOMO energy levels ranging from -5.77 to -5.79 eV, which indicated that they may be promising candidates for electron-transporting or hole-blocking materials in light-emitting diodes. These polymers in thin films can emit strong red photoluminescence (PL) around 641-662 nm with the corresponding addnl. peaks in the range 704-712 nm upon photoexcitation. Double-layer LEDs fabricated with the configuration of ITO/PEDOT/polymer/Ba/Al can emit red light with external quantum efficiencies of 0.21-0.38%. Preliminary electroluminescent (EL) results show that these polymers are novel promising candidates for red emissive materials in polymer light-emitting diodes.

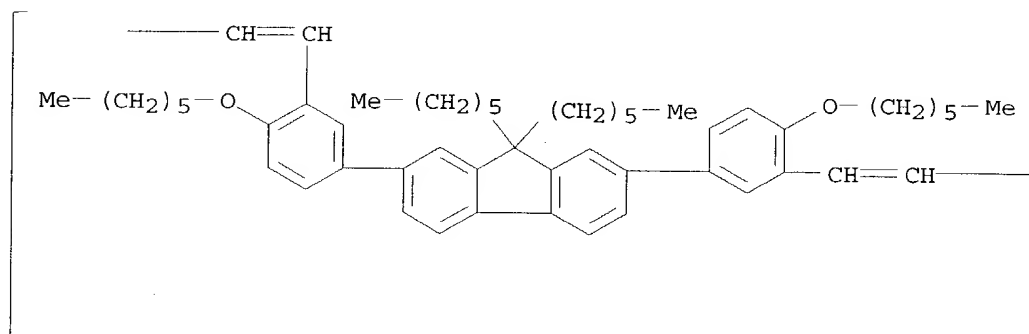
IT 649762-29-8P 649762-33-4P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (synthesis of red-emitting polyfluorene derivs. containing electron-deficient pyranylidene-malononitrile moieties)

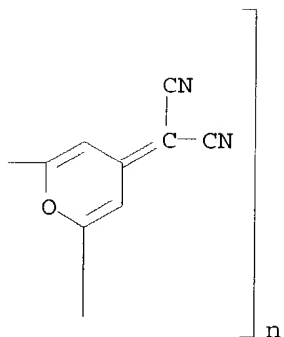
RN 649762-29-8 CAPLUS

CN Poly[[4-(dicyanomethylene)-4H-pyran-2,6-diyl]-1,2-ethenediyl[6-(hexyloxy)-1,3-phenylene] (9,9-dihexyl-9H-fluorene-2,7-diyl) [4-(hexyloxy)-1,3-phenylene]-1,2-ethenediyl] (9CI) (CA INDEX NAME)

PAGE 1-A



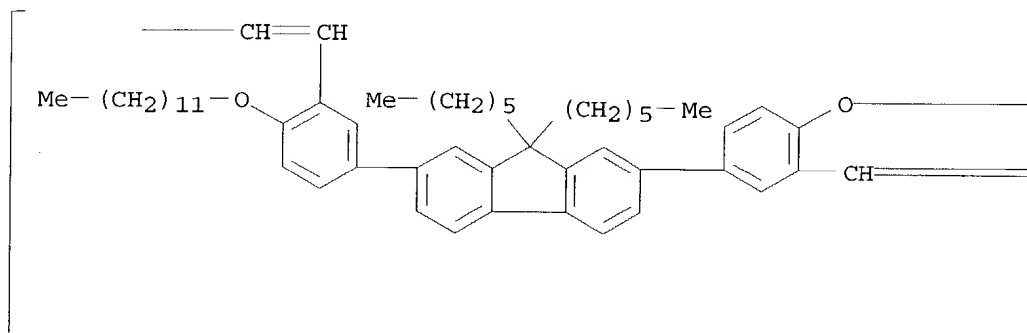
PAGE 1-B



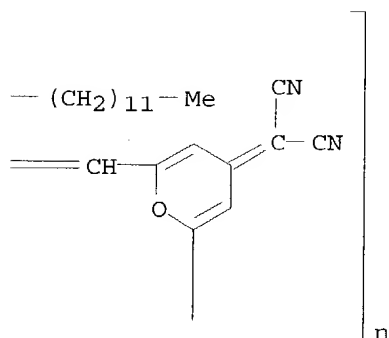
RN 649762-33-4 CAPLUS

CN Poly[[4-(dicyanomethylene)-4H-pyran-2,6-diyl]-1,2-ethenediyl[6-(dodecyloxy)-1,3-phenylene](9,9-dihexyl-9H-fluorene-2,7-diyl)[4-(dodecyloxy)-1,3-phenylene]-1,2-ethenediyl] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



- CC 35-5 (Chemistry of Synthetic High Polymers)
- ST pyranilidene malononitrile polyfluorene red emitting
- IT Cyclic voltammetry
- Electric current-potential relationship
- Glass transition temperature
- Luminescence
- Luminescence, electroluminescence
- (synthesis of red-emitting polyfluorene derivs. containing electron-deficient pyranilidene-malononitrile moieties)
- IT Poly(arylenealkenylenes)
- RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
- (synthesis of red-emitting polyfluorene derivs. containing electron-deficient pyranilidene-malononitrile moieties)
- IT 649762-25-4P 649762-26-5P 649762-27-6P 649762-29-8P
- 649762-31-2P 649762-33-4P
- RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
- (synthesis of red-emitting polyfluorene derivs. containing electron-deficient pyranilidene-malononitrile moieties)

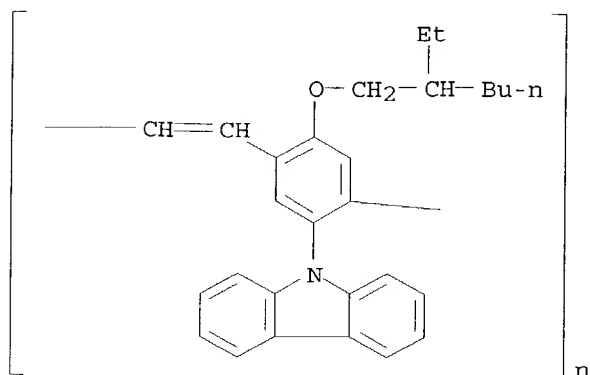
IT 111-25-1, 1-Bromohexane 143-15-7, 1-Bromododecane 1122-91-4  
1761-61-1 28286-88-6  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(synthesis of red-emitting polyfluorene derivs. containing  
electron-deficient pyranilidene-malononitrile moieties)  
IT 438002-00-7P 610322-33-3P 649762-22-1P 649762-23-2P 649762-24-3P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
(Reactant or reagent)  
(synthesis of red-emitting polyfluorene derivs. containing  
electron-deficient pyranilidene-malononitrile moieties)  
REFERENCE COUNT: 49 THERE ARE 49 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

---

L6 ANSWER 3 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 2003:417031 CAPLUS  
DOCUMENT NUMBER: 139:157064  
TITLE: Field-dependent properties of electroluminescent  
devices based on DCM-doped poly(p-phenylene vinylene)  
derivatives  
AUTHOR(S): Zhong, Guolun; Kim, Kyungkon; Lee, Dong Won; Jin,  
Jung-Il  
CORPORATE SOURCE: Department of Chemistry and Center for Photo- and  
Electro-Responsive Molecules, Korea University, Seoul,  
136-701, S. Korea  
SOURCE: Synthetic Metals (2003), 137(1-3), 1015-1016  
CODEN: SYMEDZ; ISSN: 0379-6779  
PUBLISHER: Elsevier Science B.V.  
DOCUMENT TYPE: Journal  
LANGUAGE: English

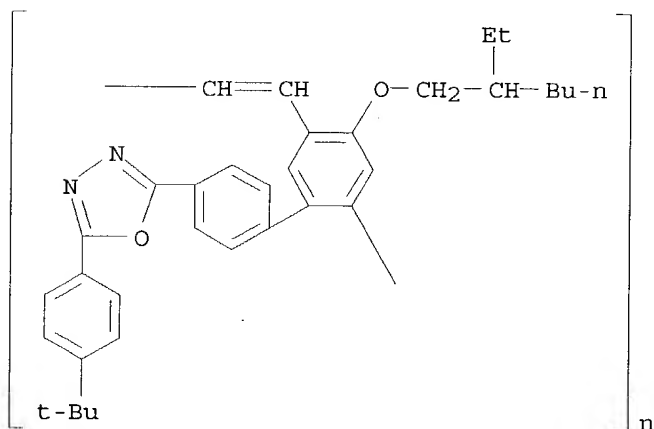
AB The authors fabricated the single layer electroluminescent (EL) devices  
using poly[2-(carbazol-9-yl)-5-(2-ethylhexyloxy)-1,4-phenylene vinylene]  
(CzEh-PPV) and poly[2-{4-[5-(4-tert-butylphenyl)-1,3,4-oxadiazolyl]-  
phenyl}-5-(2-ethylhexyloxy)-1,4-phenylene vinylene] (OxdEh-PPV) doped with  
varying weight percent of 4-(dicyanomethylene)-2-Me-6-[p-  
(dimethylamino)styryl]-4H-pyran (DCM-1). Field-dependence of the emission  
spectra of the EL devices was studied in detail: the EL device constructed  
with CzEh-PPV/DCM-1 reveals a strong field-dependence in its EL spectrum  
and the emission by DCM-1 is intensified as the applied elec. field is  
increased, whereas the device of OxdEh-PPV/DCM-1 shows an enhanced  
emission from OxdEh-PPV with increasing field.

IT 352675-59-3 569679-80-7  
RL: DEV (Device component use); USES (Uses)  
(DCM-1-doped; field-dependent properties of LEDs based on DCM-doped  
poly(p-phenylene vinylene) derivs.)  
RN 352675-59-3 CAPLUS  
CN Poly[[2-(9H-carbazol-9-yl)-5-[(2-ethylhexyl)oxy]-1,4-phenylene]-1,2-  
ethenediyl] (9CI) (CA INDEX NAME)



RN 569679-80-7 CAPLUS

CN Poly[[4'-[5-[4-(1,1-dimethylethyl)phenyl]-1,3,4-oxadiazol-2-yl]-4-[(2-ethylhexyl)oxy][1,1'-biphenyl]-2,5-diyl]-1,2-ethenediyl] (9CI) (CA INDEX NAME)



CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 36

ST LED polymer phenylene vinylene deriv dopant DCM1; band structure LED polymer phenylene vinylene deriv dopant DCM1; exciton LED polymer phenylene vinylene deriv dopant DCM1; **electroluminescence polymer** phenylene vinylene deriv dopant DCM1

IT Poly(arylenealkenylenes)

RL: DEV (Device component use); USES (Uses)

(field-dependent properties of LEDs based on DCM-doped poly(p-phenylene vinylene) derivs.)

IT Band structure

Exciton

HOMO (molecular orbital)

LUMO (molecular orbital)

(field-dependent properties of LEDs based on DCM-doped poly(p-phenylene vinylene) derivs. in relation to)

IT Luminescence, electroluminescence  
(of DCM-doped poly(p-phenylene vinylene) derivs.)

IT Electroluminescent devices  
(thin-film; field-dependent properties of LEDs based on DCM-doped poly(p-phenylene vinylene) derivs.)

IT 352675-59-3 569679-80-7  
RL: DEV (Device component use); USES (Uses)  
(DCM-1-doped; field-dependent properties of LEDs based on DCM-doped poly(p-phenylene vinylene) derivs.)

IT 51325-91-8, DCM-1  
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
(field-dependent properties of LEDs based on DCM-doped poly(p-phenylene vinylene) derivs.)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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L6 ANSWER 4 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2003:413422 CAPLUS

DOCUMENT NUMBER: 139:140609

TITLE: Efficient blue light-emission from new soluble, PPV-analogous with meta-linkage biphenyl moieties

AUTHOR(S): Zhang, Haiquan; He, Lin; Liu, Xiaodong; Li, Yupeng; Ma, Yuguang; Shen, Jiacong

CORPORATE SOURCE: Key Lab for Supramolecular Structure and Material, Jilin University, Changchun, 130023, Peop. Rep. China

SOURCE: Synthetic Metals (2003), 135-136, 207-208  
CODEN: SYMEDZ; ISSN: 0379-6779

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

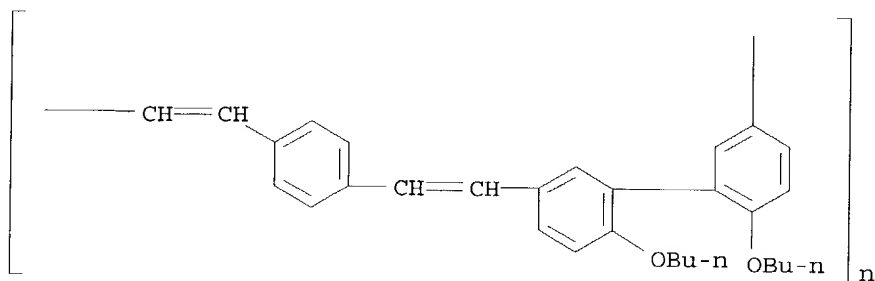
LANGUAGE: English

AB Two poly(p-phenylenevinylene) (PPV) analogous, combining with meta-linkage 2,2'-dibutyloxy biphenyl and benzene as aromatic units, which have good solubility in organic solvents and emit bright blue fluorescence in solns. and blue green fluorescence in films, were synthesized by a Wittig-Horner reaction.

IT 568583-02-8P 568583-03-9P  
RL: POF (Polymer in formulation); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(blue light-emission from soluble, PPV-analogous with meta-linkage biphenyl moieties)

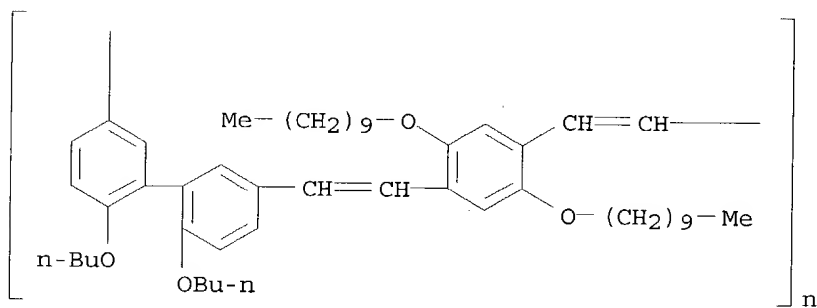
RN 568583-02-8 CAPLUS

CN Poly[(6,6'-dibutoxy[1,1'-biphenyl]-3,3'-diyl)-1,2-ethenediyl-1,4-phenylene-1,2-ethenediyl] (9CI) (CA INDEX NAME)



RN 568583-03-9 CAPLUS

CN Poly[(6,6'-dibutoxy[1,1'-biphenyl]-3,3'-diyl)-1,2-ethenediyl[2,5-bis(decyloxy)-1,4-phenylene]-1,2-ethenediyl] (9CI) (CA INDEX NAME)



CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 36, 38, 76

ST **luminescence** PPV analog **polymer light emitting diode**

IT Electroluminescent devices

(blue light-emission from soluble, PPV-analogous with meta-linkage biphenyl moieties)

IT Luminescence

UV and visible spectra

(of PPV-analogous with meta-linkage biphenyl moieties)

IT **568583-02-8P 568583-03-9P**

RL: POF (Polymer in formulation); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(blue light-emission from soluble, PPV-analogous with meta-linkage biphenyl moieties)

IT 78-40-0 109-65-9, 1-BromoButane 584-08-7, Potassium carbonate

623-24-5, 1,4-Dibromomethyl benzene 1806-29-7, [1,1'-Biphenyl]-2,2'-diol

7726-95-6, Bromine, reactions 129236-96-0

RL: RCT (Reactant); RACT (Reactant or reagent)

(blue light-emission from soluble, PPV-analogous with meta-linkage biphenyl moieties)

IT 4546-04-7P 34261-55-7P 568582-99-0P 568583-00-6P 568583-01-7P



RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(blue light-emission from soluble, PPV-analogous with meta-linkage biphenyl moieties)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

~~L6 ANSWER-5-OF-21 CAPLUS COPYRIGHT 2004 ACS on STN~~

ACCESSION NUMBER: 2003:246856 CAPLUS

DOCUMENT NUMBER: 139:36898

TITLE: Blue light-emitting poly(p-phenylenevinylene) derivatives containing alternating conjugated segments and aliphatic spacers

AUTHOR(S): Mpallas, John G.; Spiliopoulos, Ioakim K.; Mikroyannidis, John A.

CORPORATE SOURCE: Chemical Technology Laboratory, Department of Chemistry, University of Patras, Patras, GR-26500, Greece

SOURCE: Journal of Polymer Science, Part A: Polymer Chemistry (2003), 41(8), 1091-1098

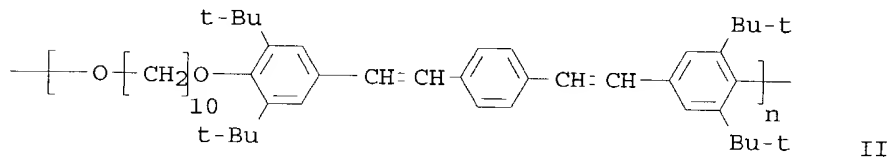
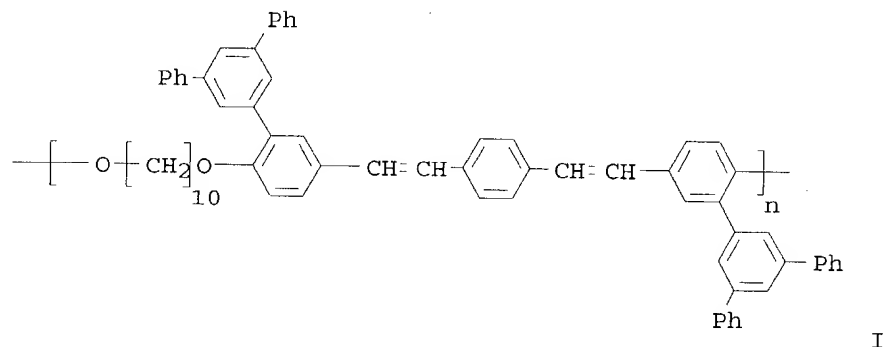
CODEN: JPACEC; ISSN: 0887-624X

PUBLISHER: John Wiley & Sons, Inc.

DOCUMENT TYPE: Journal

LANGUAGE: English

GI



AB Two new poly(p-phenylenevinylene) derivs. were prepared by Heck coupling. They contained alternating conjugated segments on the basis of p-divinylbenzene and flexible nonconjugated spacers. The synthesized polymers, having the structures I and II, were both amorphous polymers and exhibited satisfactory thermal stability. I displayed a limited solubility in

common organic solvents, whereas II dissolved readily in these solvents. The glass transition temperature values were 128° for I and 37° for II. The **polymers emitted** blue or violet-blue **light** with photoluminescent maxima at about 445 and 460 nm for solns. and thin films, resp. The bulky pendants reduced their tendency to form aggregates.

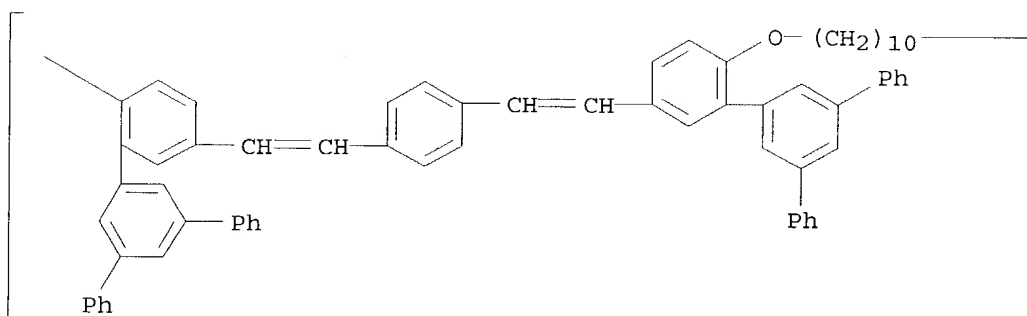
IT 540741-78-4P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(blue light-emitting poly(p-phenylenevinylene) derivs. containing  
alternating conjugated segments and aliphatic spacers)

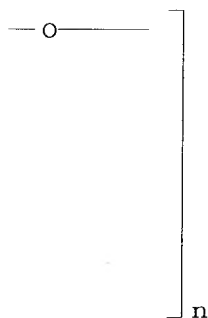
RN 540741-78-4 CAPLUS

CN Poly[oxy-1,10-decanediyl-oxy(5'-phenyl[1,1':3',1''-terphenyl]-2,5-diyl)-1,2-ethenediyl-1,4-phenylene-1,2-ethenediyl(5'-phenyl[1,1':3',1''-terphenyl]-5,2-diyl)] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



CC 35-5 (Chemistry of Synthetic High Polymers)

ST blue light emitting polyphenylenevinylene polyether; polyarylenealkenylene  
polyether blue light emitting

IT Polymerization

(Heck coupling; of blue light-emitting

- poly(p-phenylenevinylene) derivs. containing alternating conjugated segments and aliphatic spacers)
- IT Fluorescence  
Luminescence  
Thermal stability  
UV and visible spectra  
(of blue light-emitting poly(p-phenylenevinylene) derivs. containing alternating conjugated segments and aliphatic spacers)
- IT Polyethers, preparation  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(poly(arylenealkenylene)-; blue light-emitting poly(p-phenylenevinylene) derivs. containing alternating conjugated segments and aliphatic spacers)
- IT Poly(arylenealkenylenes)  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(polyether-; blue light-emitting poly(p-phenylenevinylene) derivs. containing alternating conjugated segments and aliphatic spacers)
- IT Glass transition temperature  
(synthesis of blue light-emitting poly(p-phenylenevinylene) derivs. containing alternating conjugated segments and aliphatic spacers)
- IT 540741-75-1P **540741-78-4P**  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(blue light-emitting poly(p-phenylenevinylene) derivs. containing alternating conjugated segments and aliphatic spacers)
- IT 540741-71-7P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(intermediate; in preparation of monomer for synthesis of blue light-emitting poly(p-phenylenevinylene) derivs. containing alternating conjugated segments and aliphatic spacers)
- IT 540741-73-9P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(intermediate; in preparation of monomer for synthesis of blue light-emitting poly(p-phenylenevinylene) derivs. containing alternating conjugated segments and aliphatic spacers)
- IT 540741-74-0P 540741-76-2P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(monomer; for synthesis of blue light-emitting poly(p-phenylenevinylene) derivs. containing alternating conjugated segments and aliphatic spacers)
- IT 98-86-2, Acetophenone, reactions 1139-52-2, 4-Bromo-2,6-di-tert-butylphenol 1761-61-1, 5-Bromosalicylaldehyde  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reactant; in preparation of monomer for synthesis of blue light-emitting poly(p-phenylenevinylene) derivs. containing alternating conjugated segments and aliphatic spacers)
- IT 4101-68-2, 1,10-Dibromodecane  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reactant; in preparation of monomers for synthesis of blue light-emitting poly(p-phenylenevinylene) derivs. containing alternating conjugated segments and aliphatic spacers)

IT 540741-77-3P 540741-79-5P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (synthesis of blue light-emitting poly(p-phenylenevinylene) derivs.  
 containing alternating conjugated segments and aliphatic spacers)

REFERENCE COUNT: 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 6 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:849713 CAPLUS

DOCUMENT NUMBER: 137:360138

TITLE: Luminescent block copolymers with conjugated bonds

INVENTOR(S): Noguchi, Takanobu; Tsubata, Yoshiaki Doi, Shuji

PATENT ASSIGNEE(S): Sumitomo Chemical Company, Limited, Japan

SOURCE: PCT Int. Appl., 77 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002088223	A1	20021107	WO 2002-JP4060	20020424
W: KR, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
EP 1398340	A1	20040317	EP 2002-722732	20020424
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				
JP 2003064163	A2	20030305	JP 2002-126179	20020426
PRIORITY APPLN. INFO.:				
			JP 2001-132002	A 20010427
			JP 2001-132011	A 20010427
			WO 2002-JP4060	W 20020424

AB The invention refers to a block copolymer suitable for use in electroluminescent devices, comprising two or more blocks and fluorescing in the solid state, wherein the block copolymer contains the same or different blocks made up of one or more repeating units joined by conjugated bonds, and the blocks themselves are also joined by conjugated bonds, and at least one of the blocks has a polystyrene conversion number average

mol. weight of  $1 + 103$  to  $1 + 108$ .

IT 474787-44-5DP, block polymers with bromophenylamines and bromobenzoaldehyde

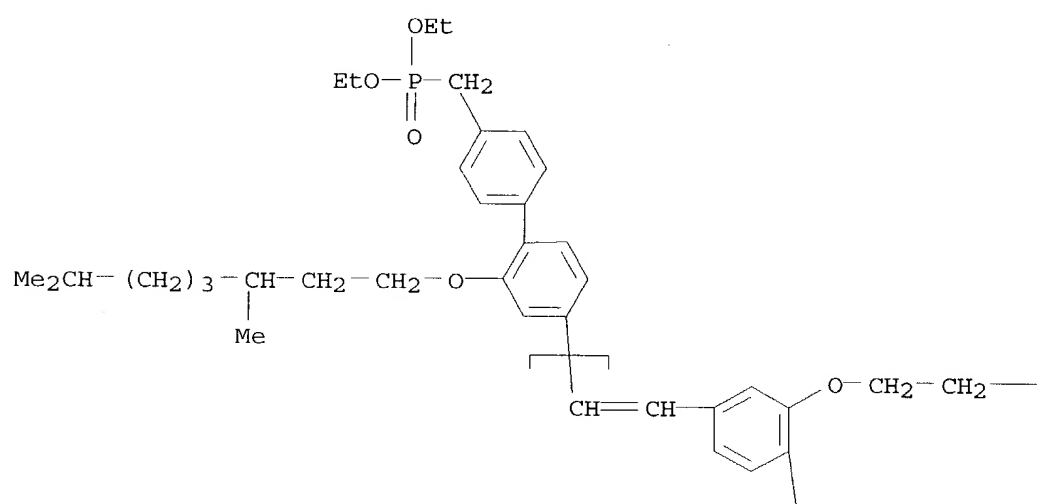
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(luminescent block copolymers with conjugated bonds)

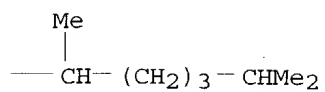
RN 474787-44-5 CAPLUS

CN Poly[[2,2'-bis[(3,7-dimethyloctyl)oxy][1,1'-biphenyl]-4,4'-diyl]-1,2-ethenediyl],  $\alpha$ -[2-[4'-[(diethoxyphosphinyl)methyl]-2-[(3,7-dimethyloctyl)oxy][1,1'-biphenyl]-4-yl]ethenyl]- $\omega$ -[4'-[(diethoxyphosphinyl)methyl]-2-[(3,7-dimethyloctyl)oxy][1,1'-biphenyl]-4-yl]- (9CI) (CA INDEX NAME)

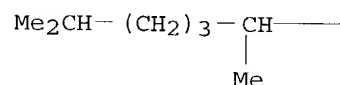
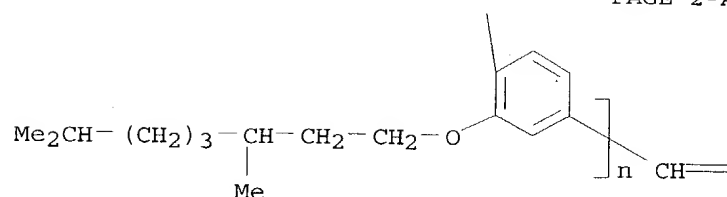
PAGE 1-A



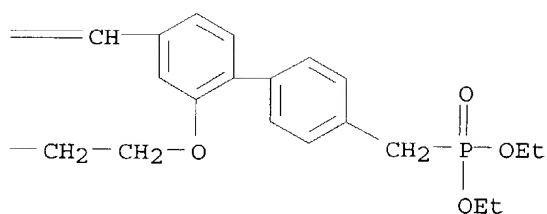
PAGE 1-B



PAGE 2-A



PAGE 2-B



- IC ICM C08G081-00  
ICS G02F001-1335; H05B033-14; H05B033-12; C09K011-06
- CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
Section cross-reference(s): 35, 36, 38
- ST block copolymer luminescent material conjugated bond
- IT **Polymers**, properties  
RL: PRP (Properties)  
(block; **luminescent** block copolymers with conjugated bonds)
- IT Conjugation (bond)  
Electroluminescent devices  
Luminescent substances  
(luminescent block copolymers with conjugated bonds)
- IT 474787-30-9P 474787-37-6P 474787-39-8P  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(luminescent block copolymers with conjugated bonds)
- IT 474787-43-4D, block **polymers** with bromoamines and bromobenzoaldehyde  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**luminescent** block copolymers with conjugated bonds)

IT 444796-14-9DP, reaction products with bromobenzoaldehyde 474787-41-2DP, reaction products with bromobenzoaldehyde 474787-42-3DP, reaction products with bromobenzoaldehyde 474787-44-5DP, block polymers with bromophenylamines and bromobenzoaldehyde  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(luminescent block copolymers with conjugated bonds)

IT 474787-32-1P 474787-35-4P  
 RL: SPN (Synthetic preparation); PREP (Preparation)

(luminescent block copolymers with conjugated bonds)

REFERENCE COUNT: 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 7 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:299569 CAPLUS

DOCUMENT NUMBER: 137:263633

TITLE: New family of polyfluorene copolymers for light emitting devices

AUTHOR(S): Holmes, Andrew B.; Rees, Ian; Sano, Takeshi; Fischmeister, Cedric; Frey, J.; Hennecke, Ulrich; Tuan, Chi-Shen; Chuah, Beng Sim; Ma, Yuguang; Martin, Rainer E.; Li, Jian; Feeder, Neil; Bond, Andrew; Cacialli, Franco; Lim, Shuang; Friend, Richard

CORPORATE SOURCE: Melville Laboratory for Polymer Synthesis, Department of Chemistry, University of Cambridge, Cambridge, CB2 3RA, UK

SOURCE: Proceedings of SPIE-The International Society for Optical Engineering (2002), 4464 (Organic Light-Emitting Materials and Devices V), 42-48  
 CODEN: PSISDG; ISSN: 0277-786X

PUBLISHER: SPIE-The International Society for Optical Engineering

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Addnl. routes were developed for the synthesis of 1,4-bis(halo)methylbenzene derivs., e.g., 2,3-dibutoxy-1,4-bis(bromomethyl)benzene (I), for Gilch dehydrohalogenation polycondensation. Gilch dehydrohalogenation of I gave a highly **fluorescent** conjugated **polymer**, i.e., poly(2,3-dibutoxy-1,4-phenylenevinylene), with a remarkably blue-shifted emission maximum compared with the corresponding family of poly(2,5-dialkoxy-1,4-phenylenevinylene)s. The polymer was thought to derive its high PL solid state fluorescence efficiency from the sterically twisted backbone and devices carrying this polymer were evaluated. A 4,4'-dibromodistyrylbenzene derivative carrying the structural feature of a 2,3-dibutoxy substitution pattern on the central ring was prepared

Polymerization

with a 9,9-dialkyl-fluorene-2,7-diboronate ester gave a conjugated polymer that showed a good green emission maximum in an electroluminescent device.

IT 462632-69-5P

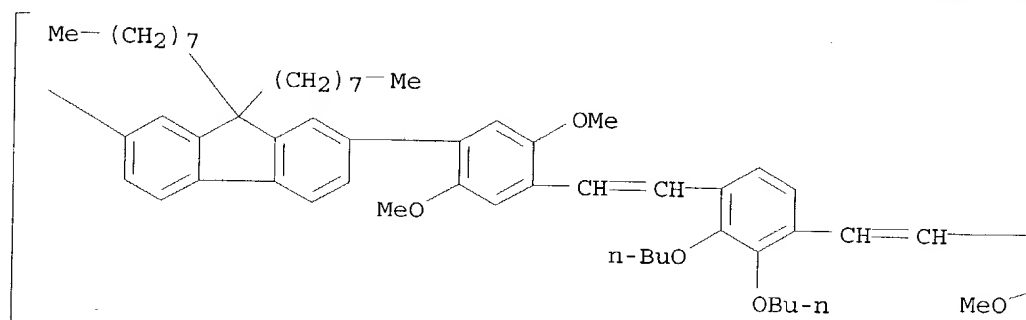
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (preparation and luminance and current characteristics of)

RN 462632-69-5 CAPLUS

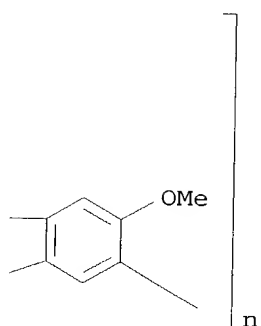
CN Poly[(9,9-dioctyl-9H-fluorene-2,7-diyl)(2,5-dimethoxy-1,4-phenylene)-1,2-

ethenediyl (2,3-dibutoxy-1,4-phenylene) -1,2-ethenediyl (2,5-dimethoxy-1,4-phenylene)] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



- CC 37-3 (Plastics Manufacture and Processing)
- ST conjugated **polymer light emitting diode**;  
polyphenylenevinylene electroluminescence photoluminescence; fluorene  
diboronate ester dibromostyrylbenzene deriv copolymer
- IT Polymerization  
(Gilch dehydrohalogenation polycondensation; of 2,3-dibutoxy-1,4-  
bis(bromomethyl)benzene)
- IT Polymerization  
(Suzuki cross-coupling; of 4,4'-dibromodistyrylbenzene derivative with  
9,9-dialkylfluorene-2,7-diboronate ester)
- IT Polymers, preparation  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(conjugated; preparation and blue-shifted photoluminescent and  
electroluminescent emission of)
- IT Poly(arylenealkenylenes)  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(dialkoxy-substituted poly(phenylenevinylene); preparation and blue-shifted



- photoluminescent and electroluminescent emission of)
- IT Luminescence  
Luminescence, electroluminescence  
(of poly(2,3-dibutoxy-1,4-phenylenevinylene) and 2,7-disubstituted fluorene derivative-4,4'-dibromodistyrylbenzene derivative copolymer)
- IT Electroluminescent devices  
(preparation and luminance and current characteristics of fluorene group-containing conjugated polymer for)
- IT 25163-62-6P 264906-79-8P 264906-80-1P 312489-42-2P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(intermediate; in synthesis of 1,4-bishalomethylbenzene derivs. for Gilch dehydrohalogenation polycondensation)
- IT 208264-15-7P  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(model compound, preparation and optical properties of; in study of origin of  
blue-shifted photoluminescent and electroluminescent emission of poly(2,3-dibutoxy-1,4-phenylenevinylene))
- IT 459165-88-9P  
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(monomer; for Suzuki cross-coupling polymerization with 2,7-disubstituted fluorene monomer)
- IT 208264-12-4P, 2,3-Dibutoxy-1,4-bis(bromomethyl)benzene  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(monomer; for synthesis of conjugated polymer by Gilch dehydrohalogenation polycondensation)
- IT 14221-01-3, Tetrakis(triphenylphosphine) palladium  
RL: CAT (Catalyst use); USES (Uses)  
(polymerization catalyst; in preparation of fluorene **polymer** for **light emitting** devices and luminance and current characteristics of)
- IT 208264-13-5P 224456-13-7P, 2,3-Dibutoxy-1,4-bis(bromomethyl)benzene homopolymer  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(preparation and blue-shifted photoluminescent and electroluminescent emission of)
- IT 459165-89-0P 462632-69-5P  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(preparation and luminance and current characteristics of)
- IT 50-00-0, Formaldehyde, reactions 110-91-8, Morpholine, reactions 120-80-9, Catechol, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reactant; in synthesis of 1,4-bishalomethylbenzene derivs. for Gilch dehydrohalogenation polycondensation)
- IT 122-52-1, Triethyl phosphite 31558-41-5 462632-68-4  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reactant; in synthesis of 4,4'-dibromodistyrylbenzene derivative for polymerization with 2,7-disubstituted fluorene monomer)
- IT 86-51-1 208264-14-6

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reactant; in synthesis of distyrylbenzene derivative model compound for  
 study of origin of blue-shifted photoluminescent and electroluminescent  
 emission of poly(2,3-dibutoxy-1,4-phenylenevinylene))

REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 8 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:179061 CAPLUS

DOCUMENT NUMBER: 137:70174

TITLE: Mechanism of one- and two-photon absorption induced  
 photoluminescence in PPV type,  
**electroluminescent polymer**

AUTHOR(S): Lee, Geon Joon; Kim, Kyungkun; Jin, Jung-Il

CORPORATE SOURCE: Center for Electro- and Photo-Responsive Molecules,  
 Korea University, Seoul, 136-701, S. Korea

SOURCE: Optics Communications (2002), 203(1-2), 151-157  
 CODEN: OPCOB8; ISSN: 0030-4018

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The authors report the luminescence properties in a  
 poly(phenylenevinylene) derivative with the carbazole pendent and alkoxy group  
 (CzEH-PPV). The two-photon excitation spectrum showed that the threshold  
 energy (2.64 eV) of two-photon absorption (TPA) is larger  
 than that (2.34 eV) expected by 1-photon excitation spectra. This implies  
 that the two- and 1-photon absorptions satisfy different selection rules.  
 Meanwhile, the two- and 1-photon absorption (OPA) induced  
 photoluminescences (PLs) occur from the same exciton band that has a  
 double min. adiabatic potential. The lifetimes of the upper and lower  
 exciton states are 280 and 370 ps, resp. By comparing the PL spectrum of  
 CzEH-PPV film to its electroluminescence spectrum of single-layer CzEH-PPV  
 light-emitting device (ITO/CzEH-PPV/Al), the species generated by OPA or  
 TPA are the charged carriers. For OPA-PL, the excitations having the  
 pulse-energy larger than 2.3  $\mu$ J at 2.96 eV produce a spectrally  
 narrowed emission band with its maximum located at 2.14 eV with the spectral  
 width of 23 meV. This is ascribed to the amplified spontaneous emission  
 enhanced by the optical wave guiding in the polymer film.

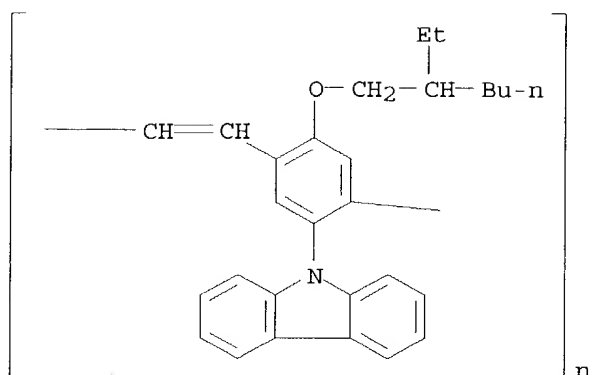
IT 352675-59-3

RL: DEV (Device component use); PEP (Physical, engineering or chemical  
 process); PRP (Properties); PYP (Physical process); PROC (Process); USES  
 (Uses)

(mechanism of one- and two-photon absorption induced photoluminescence  
 in PPV type, **electroluminescent polymer**)

RN 352675-59-3 CAPLUS

CN Poly[[2-(9H-carbazol-9-yl)-5-[(2-ethylhexyl)oxy]-1,4-phenylene]-1,2-  
 ethenediyl] (9CI) (CA INDEX NAME)



CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
 Section cross-reference(s): 36

ST two photon absorption luminescence PPV  
**electroluminescent polymer**

IT Electric current carriers  
 Electroluminescent devices  
 Energy level  
 Exciton  
 IR spectra  
 Luminescence  
 Luminescence, electroluminescence  
 Optical absorption  
 Two-photon absorption  
 (mechanism of one- and two-photon absorption induced photoluminescence in PPV type, **electroluminescent polymer**)

IT 7429-90-5, Aluminum, uses 50926-11-9, Indium tin oxide  
 RL: DEV (Device component use); USES (Uses)  
 (mechanism of one- and two-photon absorption induced photoluminescence in PPV type, **electroluminescent polymer**)

IT 352675-59-3  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)  
 (mechanism of one- and two-photon absorption induced photoluminescence in PPV type, **electroluminescent polymer**)

REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 9 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:857963 CAPLUS

DOCUMENT NUMBER: 136:151685

TITLE: Synthesis and Luminescent Studies of Poly(phenylenevinylene)s Containing a Biphenyl Moiety

AUTHOR(S): Sarker, Ananda M.; Ding, Liming; Lahti, Paul M.; Karasz, Frank E.

CORPORATE SOURCE: Department of Polymer Science & Engineering and

Department of Chemistry, University of Massachusetts  
at Amherst, Amherst, MA, 01003, USA

SOURCE:

Macromolecules (2002), 35(1), 223-230

CODEN: MAMOBX; ISSN: 0024-9297

PUBLISHER:

American Chemical Society

DOCUMENT TYPE:

Journal

LANGUAGE:

English

AB The polymers discussed in this contribution consist of phenylenevinylene chromophores linked together across flexible biphenyl "hinges" to shorten the effective conjugation length and to give sufficiently twisted structures that interchain aggregation is limited or prevented. They are poly[(2,5-dihexyloxy-p-phenylenevinylene)-alt-(4,4'-dihexyloxy-3,3'-biphenylenevinylene)] (I), poly[(2,5-dihexyloxy-p-phenylenevinylene)-alt-(2,2'-dihexyloxy-3,3'-biphenylenevinylene)] (II), and poly[(2,5-dihexyloxy-p-phenylenevinylene)-alt-(2,2'-biphenylenevinylene)] (III). Absorption spectra in dilute solution and solid states are very similar for I-III, consistent with the absence of aggregation effects in their ground electronic states. Photoluminescence emission spectra showed substantial red shifts in the solid state relative to dilute solution phase spectra.

Solution

emission quantum yields ranged from 0.26 to 0.42. LEDs based on I-III gave blue-green emission with maxima in the 480-510 nm range. The similarity of the photoluminescence and **electroluminescence** spectra for the **polymers** is consistent with emission from the same or very similar excited-state species. For LEDs based upon the highest quantum efficiency photoluminescent emitter, I, better luminance was achieved using PEDOT-PSS hole injection layers in double-layer LEDs than using PPV.

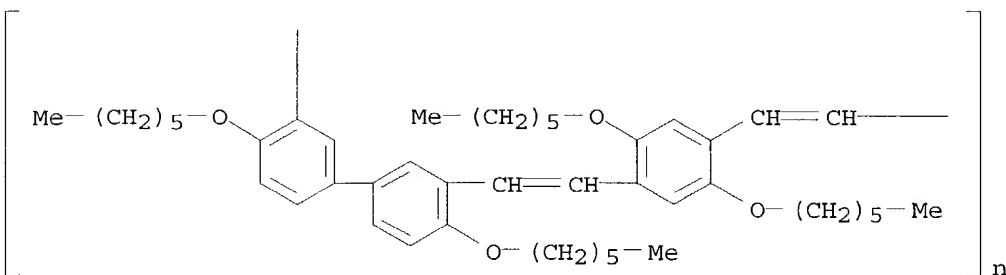
IT 394209-97-3P 394209-99-5P

RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(synthesis and luminescent studies of poly(phenylenevinylene)s containing biphenyl moiety)

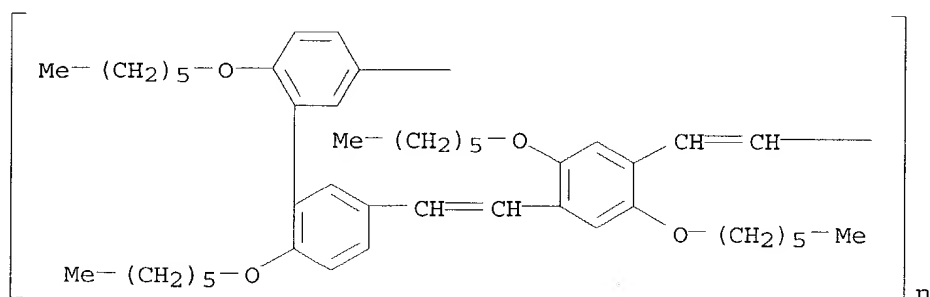
RN 394209-97-3 CAPLUS

CN Poly[[4,4'-bis(hexyloxy)[1,1'-biphenyl]-3,3'-diyl]-1,2-ethenediyl[2,5-bis(hexyloxy)-1,4-phenylene]-1,2-ethenediyl] (9CI) (CA INDEX NAME)



RN 394209-99-5 CAPLUS

CN Poly[[6,6'-bis(hexyloxy)[1,1'-biphenyl]-3,3'-diyl]-1,2-ethenediyl[2,5-bis(hexyloxy)-1,4-phenylene]-1,2-ethenediyl] (9CI) (CA INDEX NAME)



- CC 36-5 (Physical Properties of Synthetic High Polymers)  
Section cross-reference(s): 35, 73
- ST polyphenylenevinylene biphenyl deriv synthesis optical property;  
photoluminescence electroluminescence light emitting diode  
polyphenylenevinylene deriv
- IT UV absorption  
(UV-visible; of poly(phenylenevinylene)s containing biphenyl moiety)
- IT Electroluminescent devices  
(containing poly(phenylenevinylene)s with biphenyl moiety)
- IT Current density  
Emissivity  
Luminescence, electroluminescence  
(of LEDs containing poly(phenylenevinylene)s with biphenyl moiety)
- IT Luminescence  
(of poly(phenylenevinylene)s containing biphenyl moiety)
- IT Poly(arylenealkenylene)s  
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or  
engineered material use); PREP (Preparation); USES (Uses)  
(synthesis and luminescent studies of poly(phenylenevinylene)s containing  
biphenyl moiety)
- IT 128424-36-2  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(in preparation of dialdehyde)
- IT 92-88-6, 4,4'-Dihydroxy-1,1'-biphenyl 111-25-1, 1-Bromohexane  
1806-29-7, 2,2'-Dihydroxy-1,1'-biphenyl  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(in preparation of dihexyloxybiphenyl)
- IT 122-52-1, Triethyl phosphite  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(in preparation of monomers)
- IT 69551-54-8P 394209-94-0P 394209-95-1P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
(Reactant or reagent)  
(monomer; preparation of and in polymerization with dialdehyde)
- IT 142450-58-6P 271797-57-0P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
(Reactant or reagent)  
(preparation and in bromomethylation of)

IT 151903-52-5P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (preparation of and in polymerization with biphenyl monomers)

IT 271797-58-1P 271797-60-5P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (preparation of and in reaction with tri-Et phosphite)

IT 38274-14-5, 2,2'-Bis(bromomethyl)-1,1'-biphenyl  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction with tri-Et phosphite in preparation of monomer)

IT 394209-96-2P 394209-97-3P 394209-98-4P 394209-99-5P  
 394210-00-5P 394210-01-6P  
 RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or  
 engineered material use); PREP (Preparation); USES (Uses)  
 (synthesis and luminescent studies of poly(phenylenevinylene)s containing  
 biphenyl moiety)

REFERENCE COUNT: 40 THERE ARE 40 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 10 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:154336 CAPLUS

DOCUMENT NUMBER: 135:5910

TITLE: Synthesis and electroluminescence properties of  
 ortho-, meta- and para-linked polymers containing  
 oxadiazole unit

AUTHOR(S): Song, S.-Y.; Ahn, T.; Shim, H.-K.; Song, I.-S.; Kim,  
 W.-H.

CORPORATE SOURCE: Department of Chemistry and School of Molecular  
 Science (BK21), Center for Advanced Functional  
 Polymers, Korea Advanced Institute of Science and  
 Technology, Taejeon, 305-701, S. Korea

SOURCE: Polymer (2001), 42(11), 4803-4811  
 CODEN: POLMAG; ISSN: 0032-3861

PUBLISHER: Elsevier Science Ltd.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A series of **electroluminescent**  $\pi$ -conjugated **polymers**  
 containing an oxadiazole group in the backbone was prepared through Heck's  
 coupling or Wittig's condensation reaction. Poly[(2,5-bis(5-  
 hexyloxyphenyl)-1,3,4-oxadiazole)-2,2-diylvinylene-alt-1,4-  
 phenylenevinylene] (POOXPV), poly[(2,5-bis(2-hexyloxyphenyl)-1,3,4-  
 oxadiazole)-5,5-diylvinylene-alt-1,4-phenylenevinylene] (PMOXPV) and  
 poly[(2,5-diphenyl-1,3,4-oxadiazole)-2,4-diylvinylene-alt-1,4-(2,5-  
 dihexyloxy)-phenylenevinylene] (PPOXPV) were soluble in common organic solvents  
 and showed good thermal stability. The maximum photoluminescence (PL)  
 wavelengths of POOXPV, PMOXPV and PPOXPV appeared at 495, 470, and 510 nm,  
 resp. The electroluminescence (EL) spectra of POOXPV and PPOXPV showed  
 maximum peaks at 500 and 510 nm, resp., corresponding to greenish-blue light.  
 Fabricated Al/**polymer**/ITO glass single-layer **light-**  
**emitting** diodes had turn-on voltages at 5.5, 9.5, and 6.0 V, resp.  
 In blending synthesized polymers with 4-(dicyanomethylene)-2-methyl-6-[p-

(dimethylamino)styryl]-4H-pyran (DCM), the polymers are also believed to serve as excellent polymer electron-transporting materials.

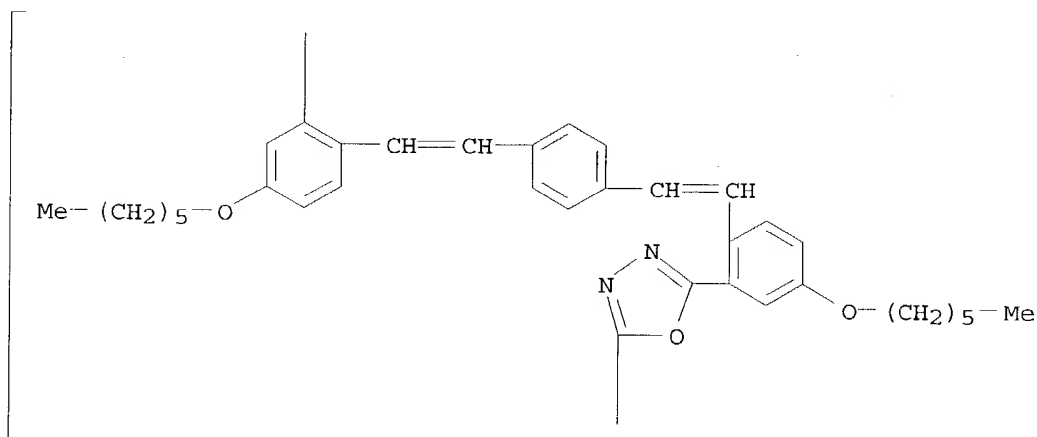
IT 241164-27-2P 341510-85-8P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(synthesis and electroluminescence properties of ortho-, meta- and para-linked polymers containing oxadiazole and phenylenevinylene unit)

RN 241164-27-2 CAPLUS

CN Poly[1,3,4-oxadiazole-2,5-diyl[5-(hexyloxy)-1,2-phenylene]-1,2-ethenediyl-1,4-phenylene-1,2-ethenediyl[4-(hexyloxy)-1,2-phenylene]] (9CI) (CA INDEX NAME)

PAGE 1-A

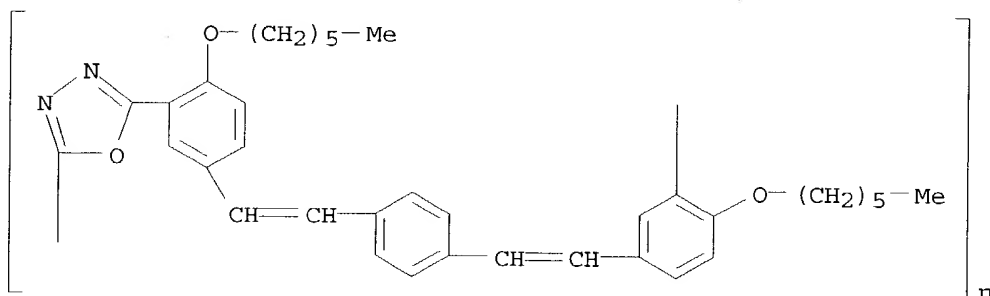


PAGE 1-B

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RN 341510-85-8 CAPLUS

CN Poly[1,3,4-oxadiazole-2,5-diyl[6-(hexyloxy)-1,3-phenylene]-1,2-ethenediyl-1,4-phenylene-1,2-ethenediyl[4-(hexyloxy)-1,3-phenylene]] (9CI) (CA INDEX NAME)



- CC 35-5 (Chemistry of Synthetic High Polymers)
- ST polyoxadiazole polyphenylenevinylene electroluminescence
- IT **Polymers**, preparation  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (conjugated; synthesis and **electroluminescence** properties of  
 ortho-, meta- and para-linked polymers containing oxadiazole and  
 phenylenevinylene unit)
- IT Polymerization  
 (in synthesis of ortho-, meta- and para-linked polymers containing  
 oxadiazole and phenylenevinylene unit)
- IT Polyoxadiazoles  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (poly(arylenealkenylene)-; synthesis and electroluminescence properties  
 of ortho-, meta- and para-linked polymers containing oxadiazole and  
 phenylenevinylene unit)
- IT Poly(arylenealkenylenes)  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (polyoxadiazole-; synthesis and electroluminescence properties of  
 ortho-, meta- and para-linked polymers containing oxadiazole and  
 phenylenevinylene unit)
- IT Electroluminescent devices  
 Luminescence, electroluminescence  
 UV and visible spectra  
 (synthesis and electroluminescence properties of ortho-, meta- and  
 para-linked polymers containing oxadiazole and phenylenevinylene unit)
- IT 51325-91-8, 4-(Dicyanomethylene)-2-methyl-6-[p-(dimethylamino)styryl]-4H-  
 pyran  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (emissive material; synthesis and electroluminescence properties of  
 ortho-, meta- and para-linked polymers containing oxadiazole and  
 phenylenevinylene unit)
- IT 25067-59-8, Poly(N-vinylcarbazole)  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (hole transporting material; synthesis and electroluminescence  
 properties of ortho-, meta- and para-linked polymers containing oxadiazole



and phenylenevinylene unit)

IT 341510-73-4  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (in preparation of oxadiazole monomer for synthesis of ortho-, meta- and para-linked polymers containing oxadiazole and phenylenevinylene unit)

IT 341510-78-9P  
 RL: PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)  
 (intermediate; in preparation of oxadiazole monomer for synthesis of ortho-, meta- and para-linked polymers containing oxadiazole and phenylenevinylene unit)

IT 56306-81-1P, Methyl 2-hexyloxybenzoate 62176-19-6P, 5-Bromo-2-hexyloxybenzoic acid 107821-40-9P 341510-72-3P 341510-74-5P 341510-75-6P 341510-79-0P 341510-80-3P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (intermediate; in preparation of oxadiazole monomer for synthesis of ortho-, meta- and para-linked polymers containing oxadiazole and phenylenevinylene unit)

IT 341510-76-7P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (intermediate; in preparation of oxadiazole monomer for synthesis of ortho-, meta- and para-linked polymers containing oxadiazole and phenylenevinylene unit)

IT 241164-25-0P 341510-81-4P  
 RL: PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)  
 (monomer; for synthesis of ortho-, meta- and para-linked polymers containing oxadiazole and phenylenevinylene unit)

IT 111-25-1, 1-Bromohexane 119-36-8, Methyl 2-hydroxybenzoate 7803-57-8, Hydrazine monohydrate 19438-10-9, Methyl 3-hydroxybenzoate  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reactant; in preparation of oxadiazole monomer for synthesis of ortho-, meta- and para-linked polymers containing oxadiazole and phenylenevinylene unit)

IT 241164-27-2P 341510-82-5P 341510-84-7P 341510-85-8P 341510-86-9P 341510-88-1P  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (synthesis and electroluminescence properties of ortho-, meta- and para-linked polymers containing oxadiazole and phenylenevinylene unit)

REFERENCE COUNT: 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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L6 ANSWER 11 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2001:98497 CAPLUS  
 DOCUMENT NUMBER: 134:170602  
 TITLE: **Polymeric fluorescent substance and polymer light emitting device**  
 INVENTOR(S): Noguchi, Takanobu; Doi, Shuji; Kitano, Makoto  
 PATENT ASSIGNEE(S): Sumitomo Chemical Company, Limited, Japan  
 SOURCE: Eur. Pat. Appl., 36 pp.

CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1074600	A2	20010207	EP 2000-116171	20000801
EP 1074600	A3	20020306		

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO

TW 484341	B	20020421	TW 2000-89114902	20000726
JP 2001123156	A2	20010508	JP 2000-232770	20000801

PRIORITY APPLN. INFO.: JP 1999-219996 A 19990803

AB **Polymeric fluorescent** substances are described which comprise a repeating unit comprising 2-5 arylene groups or heterocyclic compound groups in combination with other arylene vinylene repeating units. Light sources and displays employing the materials are also described.

IT **325461-52-7P 325461-58-3P**

RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(**fluorescent** arylene vinylene **polymers** and **light-emitting** devices and displays using them)

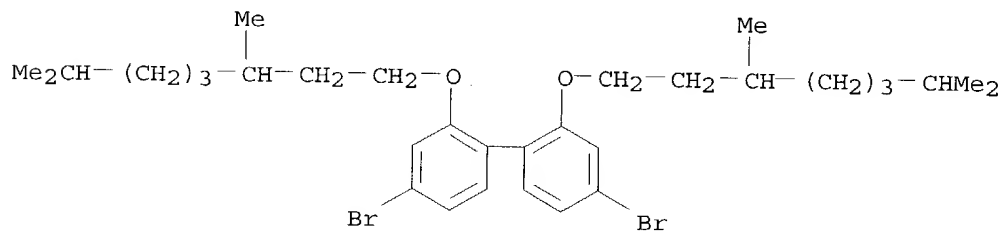
RN 325461-52-7 CAPLUS

CN 1,1'-Biphenyl, 2,2'-bis[(3,7-dimethyloctyl)oxy]-4,4'-diethenyl-, polymer with 1,4-dibromo-2,5-bis[(3,7-dimethyloctyl)oxy]benzene and 4,4'-dibromo-2,2'-bis[(3,7-dimethyloctyl)oxy]-1,1'-biphenyl (9CI) (CA INDEX NAME)

CM 1

CRN 325461-51-6

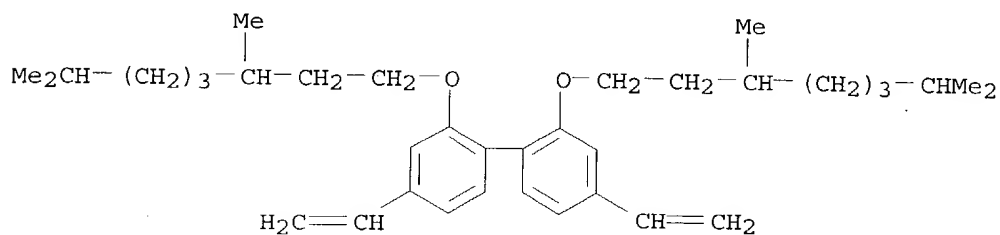
CMF C32 H48 Br2 O2



CM 2

CRN 325461-50-5

CMF C36 H54 O2

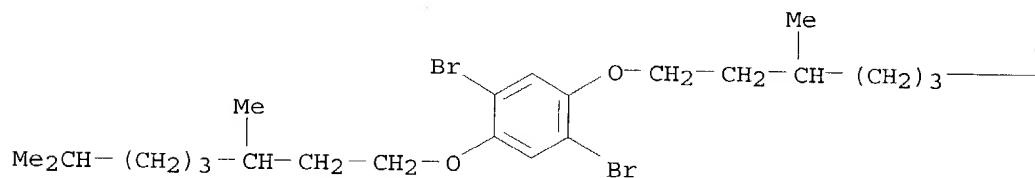


CM 3

CRN 325461-28-7

CMF C26 H44 Br2 O2

PAGE 1-A



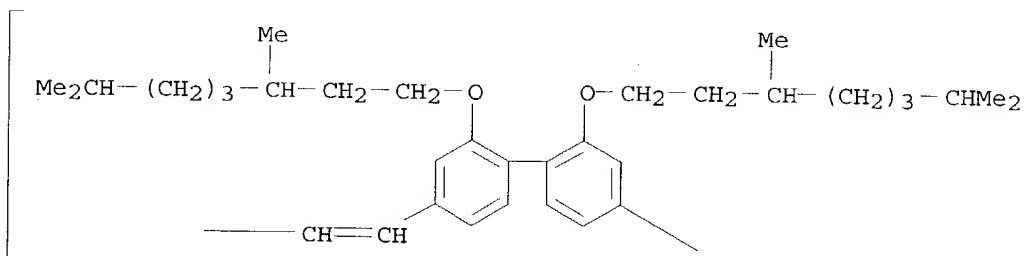
PAGE 1-B

—CHMe<sub>2</sub>

RN 325461-58-3 CAPLUS

CN Poly[[2,2'-bis[(3,7-dimethyloctyl)oxy][1,1'-biphenyl]-4,4'-diyl]-1,2-ethenediyl] (9CI) (CA INDEX NAME)

PAGE 1-A



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IC ICM C09K011-06  
ICS H05B033-14  
CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
Section cross-reference(s): 38, 74, 76  
ST arylene vinylene **fluorescent polymer**  
IT **Electroluminescent devices**  
Fluorescent substances  
(**fluorescent** arylene vinylene **polymers** and **light-emitting** devices and displays using them)  
IT Poly(arylenealkenylenes)  
RL: DEV (Device component use); USES (Uses)  
(**fluorescent** arylene vinylene **polymers** and **light-emitting** devices and displays using them)  
IT 138184-36-8P 147814-99-1P 325461-27-6P 325461-31-2P 325461-33-4P  
325461-37-8P 325461-40-3P 325461-43-6P 325461-46-9P 325461-49-2P  
325461-52-7P 325461-56-1P 325461-57-2P 325461-58-3P  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(**fluorescent** arylene vinylene **polymers** and **light-emitting** devices and displays using them)

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L6 ANSWER 12 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 2000:344989 CAPLUS  
DOCUMENT NUMBER: 133:151020  
TITLE: Poly[(p-phenylene vinylene)-alt-(2,2'-biphenylene vinylene)]s: new conjugated polymers with high solid state photoluminescence quantum efficiencies  
AUTHOR(S): Xu, B.; Zhang, J.; Peng, Z.  
CORPORATE SOURCE: Department of Chemistry, University of Missouri-Kansas City, Kansas City, MO, 64110, USA  
SOURCE: Synthetic Metals (2000), 113(1-2), 35-38  
CODEN: SYMEDZ; ISSN: 0379-6779  
PUBLISHER: Elsevier Science S.A.  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB A polymer based on biphenyl-linked oligo(phenylene vinylene)s was prepared which has linking at the 2,2' position of the biphenyl ring and the steric interactions result a twisted (possible helical) structure to be formed.

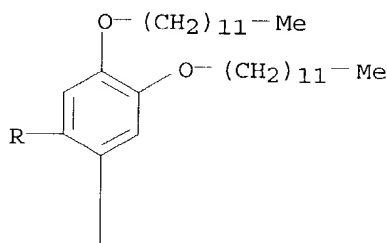
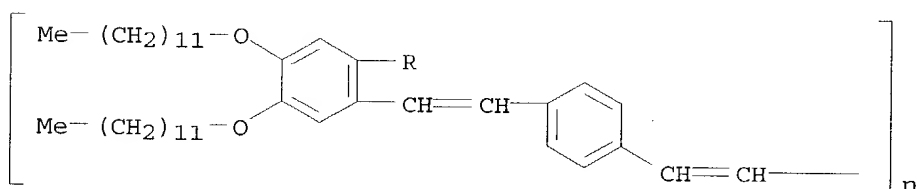
The twisted structure of the biphenyl unit causes a decrease in the effective conjugation length of the **polymer**, allowing **luminescence** color control, and limits the inter-chain interactions, enhancing the photoluminescence quantum efficiency.

IT 287493-04-3P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(preparation of poly[(p-phenylene vinylene)-(2,2'-biphenylene vinylene)]  
conjugated polymers with twisted biphenyl chain structure and high  
photoluminescence quantum efficiency)

RN 287493-04-3 CAPLUS

CN Poly[[4,4',5,5'-tetrakis(dodecyloxy)[1,1'-biphenyl]-2,2'-diyl]-1,2-ethenediyl-1,4-phenylene-1,2-ethenediyl] (9CI) (CA INDEX NAME)



CC 35-5 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 36, 74

ST polyphenylene vinylene conjugated polymer twisted biphenyl prepn;  
conjugation length photoluminescence quantum efficiency polyphenylene  
vinylene

IT Polymers, preparation

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(conjugated; preparation of poly[(p-phenylene vinylene)-(2,2'-biphenylene  
vinylene)] conjugated polymers with twisted biphenyl chain structure  
and high photoluminescence quantum efficiency)

IT Polymer chains

(conjugation length; preparation of poly[(p-phenylene vinylene)-(2,2'-  
biphenylene vinylene)] conjugated polymers with twisted biphenyl chain  
structure and high photoluminescence quantum efficiency)

IT Fluorescence

Helix (conformation)

Luminescence

(preparation of poly[(p-phenylene vinylene)-(2,2'-biphenylene vinylene)]  
conjugated polymers with twisted biphenyl chain structure and high  
photoluminescence quantum efficiency)

- IT Poly(arylenealkenylenes)  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (preparation of poly[(p-phenylene vinylene)-(2,2'-biphenylene vinylene)]  
 conjugated polymers with twisted biphenyl chain structure and high  
 photoluminescence quantum efficiency)
- IT 42244-53-1P, 1,2-Didodecyloxybenzene 181144-60-5P, 4,5-Didodecyloxy-1,2-  
 diiodobenzene  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (intermediate; preparation of poly[(p-phenylene vinylene)-(2,2'-biphenylene  
 vinylene)] conjugated polymers with twisted biphenyl chain structure  
 and high photoluminescence quantum efficiency)
- IT 287493-02-1P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (monomer; preparation of poly[(p-phenylene vinylene)-(2,2'-biphenylene  
 vinylene)] conjugated polymers with twisted biphenyl chain structure  
 and high photoluminescence quantum efficiency)
- IT 287493-03-2P 287493-04-3P  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (preparation of poly[(p-phenylene vinylene)-(2,2'-biphenylene vinylene)]  
 conjugated polymers with twisted biphenyl chain structure and high  
 photoluminescence quantum efficiency)
- IT 109-72-8, Butyllithium, reactions 120-80-9, 1,2-Benzenediol, reactions  
 7553-56-2, Iodine, reactions 30141-71-0, Bromododecane  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (preparation of poly[(p-phenylene vinylene)-(2,2'-biphenylene vinylene)]  
 conjugated polymers with twisted biphenyl chain structure and high  
 photoluminescence quantum efficiency)
- REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 13 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 1999:456090 CAPLUS  
 DOCUMENT NUMBER: 131:200539  
 TITLE: New soluble light-emitting diode  
 polymer containing oxadiazole unit  
 AUTHOR(S): Song, S.-Y.; Jang, M. S.; Shim, H.-K.; Song, I.-S.;  
 Kim, W.-H.  
 CORPORATE SOURCE: Department of Chemistry, Korea Advanced Institute of  
 Science and Technology, Taejeon, S. Korea  
 SOURCE: Synthetic Metals (1999), 102(1-3), 1116-1117  
 CODEN: SYMEDZ; ISSN: 0379-6779  
 PUBLISHER: Elsevier Science S.A.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB A new light-emitting (LED) polymer  
 poly{[2,5-bis(5-hexyloxyphenyl)-1,3,4-oxadiazole]-diylvinylene-alt-1,4-  
 phenylene vinylene} (POOXPV) with oxadiazole unit was synthesized and  
 characterized by UV-visible and photoluminescence (PL) spectroscopy. This  
 polymer is soluble in common organic solvents and has good thermal stability up  
 to ca. 400°. The UV absorption and PL emission maxima were 360 nm

and about 500 nm, resp. In order to investigate electron transporting property, the polymer was blended with poly[2-methoxy-5-(2-ethylhexyloxy)-1,4-phenylenevinylene] (MEH-PPV). The device showed bright orange-red color and enhanced EL power relative to that of MEH-PPV.

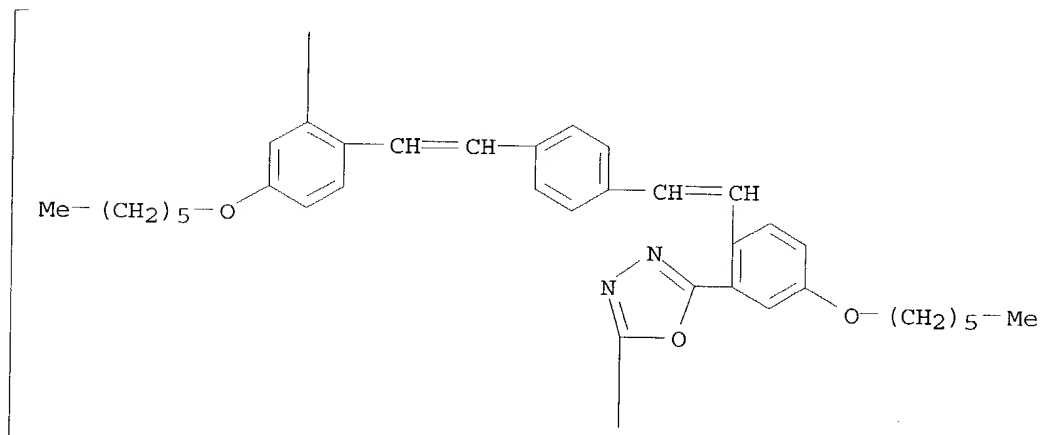
IT 241164-27-2

RL: DEV (Device component use); POF (Polymer in formulation); PRP (Properties); USES (Uses)  
(new soluble **light-emitting diode polymer** containing oxadiazole unit)

RN 241164-27-2 CAPLUS

CN Poly[1,3,4-oxadiazole-2,5-diyl[5-(hexyloxy)-1,2-phenylene]-1,2-ethenediyl-1,4-phenylene-1,2-ethenediyl[4-(hexyloxy)-1,2-phenylene]] (9CI) (CA INDEX NAME)

PAGE 1-A



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- CC 37-3 (Plastics Manufacture and Processing)  
Section cross-reference(s): 73
- ST polyphenylene vinylene hexyloxyphenyl oxadiazole LED
- IT Electric current-potential relationship  
Electroluminescent devices  
Luminescence  
Luminescence, electroluminescence  
(new soluble **light-emitting diode polymer**  
containing oxadiazole unit)
- IT **Polymer** blends  
RL: DEV (Device component use); POF (Polymer in formulation); PRP  
(Properties); USES (Uses)  
(new soluble **light-emitting diode polymer**  
containing oxadiazole unit)
- IT Poly(arylenealkenylenes)  
RL: DEV (Device component use); POF (Polymer in formulation); PRP  
(Properties); USES (Uses)  
(oxadiazole-containing; new soluble **light-emitting diode polymer** containing oxadiazole unit)
- IT 138184-36-8, MEH-PPV 241164-26-1 241164-27-2  
RL: DEV (Device component use); POF (Polymer in formulation); PRP  
(Properties); USES (Uses)  
(new soluble **light-emitting diode polymer**  
containing oxadiazole unit)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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L6 ANSWER 14 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:800839 CAPLUS

DOCUMENT NUMBER: 130:154253

TITLE: A New Electron-withdrawing Group Containing  
Poly(1,4-phenylenevinylene)

AUTHOR(S): Boardman, Fredrick H.; Grice, Alan W.; Ruether, Manuel



G.; Sheldon, Timothy J.; Bradley, Donal D. C.; Burn, Paul L.  
 CORPORATE SOURCE: The Dyson Perrins Laboratory, Oxford University,  
 Oxford, OX1 3QY, UK  
 SOURCE: Macromolecules (1999), 32(1), 111-117  
 CODEN: MAMOBX; ISSN: 0024-9297  
 PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

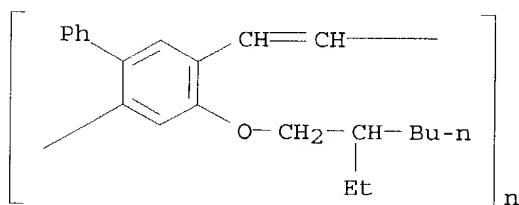
AB We have synthesized and investigated the electronic properties of poly[2-(2'-ethylhexyloxy)-5-phenyl-1,4-phenylenevinylene] (I) and its methylsulfonyl derivative poly[2-(2'-ethylhexyloxy)-5-(4''-methylsulfonylphenyl)-1,4-phenylenevinylene] (II). Polymer II contains a second-order nonlinear optic chromophore which is in conjugation with the polymer backbone. Polymers I and II were used as the electroluminescent (EL) layers in single layer light-emitting diodes (LEDs) (ITO/polymer/Al). We have found that when I was used, the LEDs had an external EL quantum efficiency of 0.01%. Attachment of the methylsulfonyl moiety to I to give II in an attempt to increase the electron affinity of the parent polymer was found to make no difference to the efficiency of the single layer EL devices and appeared qual. to reduce their lifetimes.

IT 220186-61-8P 220186-62-9P

RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (preparation and electronic properties and application in LED)

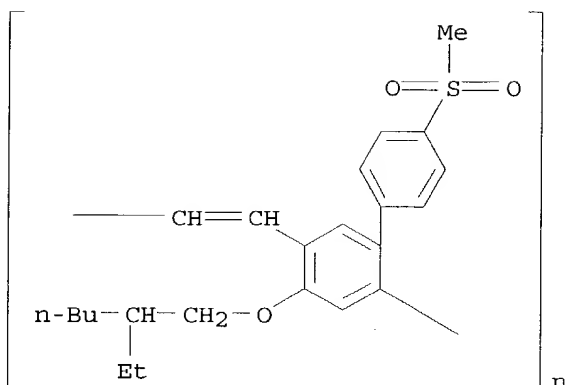
RN 220186-61-8 CAPLUS

CN Poly[[4-[(2-ethylhexyl)oxy][1,1'-biphenyl]-2,5-diyl]-1,2-ethenediyl] (9CI)  
 (CA INDEX NAME)



RN 220186-62-9 CAPLUS

CN Poly[[4-[(2-ethylhexyl)oxy]-4'-(methylsulfonyl)[1,1'-biphenyl]-2,5-diyl]-1,2-ethenediyl] (9CI) (CA INDEX NAME)



- CC 37-3 (Plastics Manufacture and Processing)  
Section cross-reference(s): 73
- ST polyphenylenevinylene prepn electroluminescent device; LED  
polyphenylenevinylene deriv; ethylhexyloxy polyphenylenevinylene LED;  
methylsulfonyl polyphenylenevinylene LED
- IT Electroluminescent devices  
(LED prepared from hexyloxy- and methylsulfonyl group-containing  
poly(phenylenevinylenes) and ITO and aluminum)
- IT Luminescence  
Luminescence, electroluminescence  
(hexyloxy- and methylsulfonyl group-containing poly(phenylenevinylenes))
- IT Poly(arylenealkenyls)  
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic  
preparation); PREP (Preparation); USES (Uses)  
(hexyloxy- and methylsulfonyl group-containing; preparation and electronic  
properties and application in LED)
- IT 7429-90-5, Aluminum, uses 50926-11-9, ITO  
RL: DEV (Device component use); USES (Uses)  
(LED prepared from hexyloxy- and methylsulfonyl group-containing  
poly(phenylenevinylenes) and ITO and aluminum)
- IT 166447-07-0, 1,4-Dimethyl-2-(2'-ethylhexyloxy)benzene  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(bromination of)
- IT 220186-59-4P 220186-64-1P 220186-65-2P 220186-66-3P 220186-67-4P  
220186-68-5P 220186-69-6P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
(Reactant or reagent)  
(preparation and characterization of)
- IT 220186-58-3P 220186-60-7P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation and characterization of)
- IT 220186-61-8P 220186-62-9P  
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic  
preparation); PREP (Preparation); USES (Uses)  
(preparation and electronic properties and application in LED)
- IT 220186-57-2P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
(Reactant or reagent)  
(preparation and polymerization of)

IT 220186-63-0P, 1-Bromo-2,5-dimethyl-4-(2'-ethylhexyloxy)benzene  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
(Reactant or reagent)  
(preparation and reaction with tributylphenylstannane)

IT 960-16-7, Tributylphenylstannane 54848-49-6  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction with bromodimethyl(ethylhexyloxy)benzene)

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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L6 ANSWER 15 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:435461 CAPLUS

DOCUMENT NUMBER: 129:154241

TITLE: Enhanced **electroluminescence** from  
single-layer **polymer light-**  
**emitting devices**

AUTHOR(S): Cimrova, Vera; Neher, Dieter; Remmers, Marcus; Kminek,  
Ivan

CORPORATE SOURCE: Institute of Macromolecular Chemistry, Academy of  
Sciences of the Czech Republic, Prague, 162 06/6,  
Czech Rep.

SOURCE: Proceedings - Electrochemical Society (1998),  
98-2(Proceedings of the Symposium on Light Emitting  
Devices for Optoelectronic Applications, 1998), 29-50  
CODEN: PESODO; ISSN: 0161-6374

PUBLISHER: Electrochemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

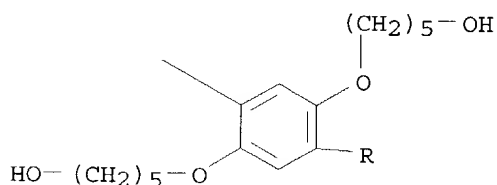
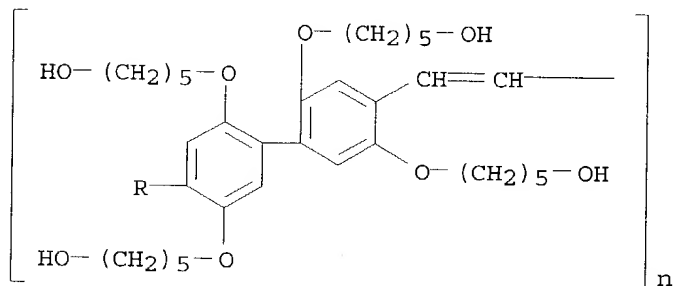
AB The absorption, photoluminescence (PL) and electroluminescence (EL) of  
thin films of soluble electroluminescent poly(p-phenylene-vinylene)s and  
their blends with a hole transport polymer, poly(phenylbiphenyl-  
silylene), were studied. Further, the blends were doped with the electron  
transporting compound - 2-(4-biphenyl)-5-(4-tert-butyl-phenyl)-1,3,4-  
oxadiazole. Efficient blue light-emitting devices (LEDs) with an  
air-stable (Al) electrode based on such polymer blends were fabricated.  
In contrast to LEDs made of pure **electroluminescent**  
**polymers**, an increase in external **EL** efficiencies by up  
to two orders of magnitude was achieved in these LEDs. This enhancement  
is far above the increase in PL efficiency of the blend layers. The  
charge photogeneration and photostability were studied complementary to  
the PL and EL. In comparison with the pure **electroluminescent**  
**polymers** an increase in the charge photogeneration efficiency and  
significantly improved photostability was observed in the blends.

IT 210973-94-7

RL: DEV (Device component use); POF (Polymer in formulation); PRP  
(Properties); USES (Uses)  
(**light-emitting devices using polymer**  
blends with poly(phenylbiphenyl silylene))

RN 210973-94-7 CAPLUS

CN Poly[[2,2',2'',5,5',5'''-hexakis[(5-hydroxypentyl)oxy][1,1':4',1'''-terphenyl]-4,4'''-diyl]-1,2-ethenediyl] (9CI) (CA INDEX NAME)



- CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
Section cross-reference(s): 38, 76
- ST **polymer** blend **electroluminescent** device terphenyl vinylene; phenylene vinylene **polymer** blend **light emission**; silylene **electroluminescent polymer** blend terphenyl vinylene
- IT **Electroluminescent** devices  
(blue-emitting; **polymer light-emitting** devices using blends of poly(p-terphenyldiyl-vinylene) and poly(phenylbiphenylyl silylene))
- IT Poly(arylenealkenylenes)  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(ether substituted; **polymer light-emitting** devices using blends of poly(p-terphenyldiyl-vinylene) and poly(phenylbiphenylyl silylene))
- IT **Polymer** blends  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(**light-emitting** devices using blends of poly(p-terphenyldiyl-vinylene) and poly(phenylbiphenylyl silylene))
- IT Luminescence  
Luminescence, electroluminescence  
UV and visible spectra  
(of poly(p-terphenyldiyl-vinylene) - poly(phenylbiphenylyl silylene) **polymer** blends for **light emitting** diodes)
- IT Electric current carriers  
(photocarriers, photogeneration efficiency; of poly(p-terphenyldiyl-vinylene) - poly(phenylbiphenylyl silylene) **polymer** blends)

- for **light emitting** diodes)
- IT Electric current-potential relationship  
(**polymer light-emitting** devices using blends of poly(p-terphenyldiyl-vinylene) and poly(phenylbiphenylsilylene))
- IT Poly(arylenealkenylenes)  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(**polymer light-emitting** devices using blends of poly(p-terphenyldiyl-vinylene) and poly(phenylbiphenylsilylene))
- IT 15082-28-7  
RL: DEV (Device component use); MOA (Modifier or additive use); PRP (Properties); USES (Uses)  
(**light-emitting** devices using **polymer** blends containing)
- IT 146525-78-2  
RL: DEV (Device component use); POF (Polymer in formulation); PRP (Properties); USES (Uses)  
(**light-emitting** devices using **polymer** blends with poly(p-terphenyldiyl-vinylenes))
- IT 210973-94-7  
RL: DEV (Device component use); POF (Polymer in formulation); PRP (Properties); USES (Uses)  
(**light-emitting** devices using **polymer** blends with poly(phenylbiphenylsilylene))

REFERENCE COUNT: 86 THERE ARE 86 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 16 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:410859 CAPLUS

DOCUMENT NUMBER: 129:101707

TITLE: **Blue light-emitting** devices based on novel **polymer** blends

AUTHOR(S): Cimrova, Vera; Neher, Dieter; Remmers, Marcus; Kminek, Ivan

CORPORATE SOURCE: Institute Macromolecular Chemistry, Academy Sciences Czech Republic, Prague, 16206, Czech Rep.

SOURCE: Advanced Materials (Weinheim, Germany) (1998), 10(9), 676-680  
CODEN: ADVMEW; ISSN: 0935-9648

PUBLISHER: Wiley-VCH Verlag GmbH

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The photo- (PL) and **electroluminescence** (EL) of **polymer** blends composed of soluble poly(p-terphenyldiyl-vinylene) (P3V) as the **luminescent polymer** and poly(phenylbiphenylsilylene) (PPBSi) as the hole-transporting polymer were investigated. The EL efficiency was significantly improved by blending of the 2 polymers with similar HOMO positions compared to devices fabricated only from the **luminescent polymer**. The EL onset and driving voltages of the single- and multicomponent devices were nearly identical due to the similarity in the HOMO and LUMO positions of the 2

components. The improved EL efficiency was explained by the increase in the PL efficiency upon blending, by an improved probability for charge carrier recombination in the blend layer, and by a reduced exciton quenching at the Al cathode. External EL efficiencies of  $\leq 0.2\%$  were recorded at a driving voltage of 15 V which was quite high for a blue single-layer light emitting device with an air-stable Al cathode.

IT 178561-69-8

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PRP (Properties); PROC (Process); USES (Uses)

(blue LEDs based on novel polymer blend of poly(p-terphenyldiyl-vinylene) and poly(phenylbiphenylsilylene))

RN 178561-69-8 CAPLUS

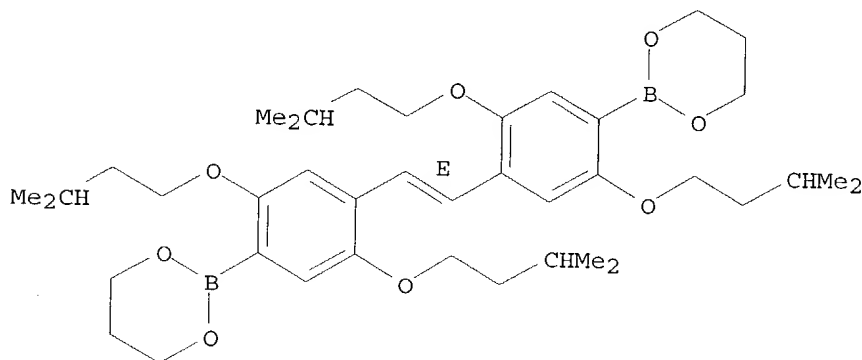
CN 1,3,2-Dioxaborinane, 2,2'-[(1E)-1,2-ethenediylbis[2,5-bis(3-methylbutoxy)-4,1-phenylene]]bis-, polymer with 1,4-dibromo-2,5-bis(3-methylbutoxy)benzene (9CI) (CA INDEX NAME)

CM 1

CRN 178561-65-4

CMF C40 H62 B2 O8

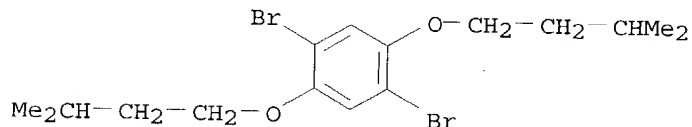
Double bond geometry as shown.



CM 2

CRN 128424-48-6

CMF C16 H24 Br2 O2



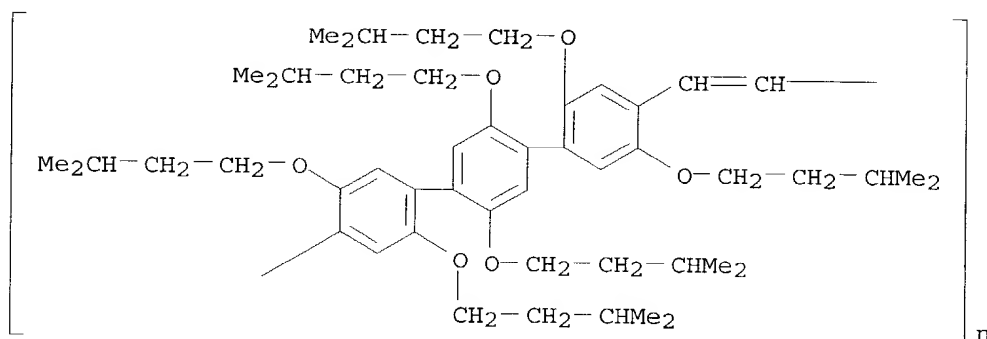
IT 178561-79-0

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PRP (Properties); PROC (Process); USES (Uses)

(**luminescent polymer**; blue LEDs based on novel polymer blend of poly(p-terphenyldiyl-vinylene) and poly(phenylbiphenylsilylene))

RN 178561-79-0 CAPLUS

CN Poly[[2,2',2'',5,5',5''-hexakis(3-methylbutoxy)[1,1':4',1''-terphenyl]-4,4''-diyl]-(1E)-1,2-ethenediyl] (9CI) (CA INDEX NAME)



CC 73-12 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 38

ST **polymer** blend photoluminescence **electroluminescence**  
blue LED; polyterphenylvinylene polyphenylbiphenylsilylene blend  
photoluminescence electroluminescence LED

IT Poly(arylenealkylenes)

Polymer blends

Polysilanes

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PRP (Properties); PROC (Process); USES (Uses)

(blue LEDs based on novel polymer blend of poly(p-terphenyldiyl-vinylene) and poly(phenylbiphenylsilylene))

IT Electroluminescent devices

(blue-emitting; blue LEDs based on novel polymer blend of poly(p-terphenyldiyl-vinylene) and poly(phenylbiphenylsilylene))

IT Luminescence

Luminescence, electroluminescence

(of blue LEDs based on novel polymer blend of poly(p-terphenyldiyl-vinylene) and poly(phenylbiphenylsilylene))

IT 178561-69-8 178561-70-1

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PRP (Properties); PROC (Process); USES (Uses)

(blue LEDs based on novel polymer blend of poly(p-terphenyldiyl-vinylene) and poly(phenylbiphenylsilylene))

IT 852-38-0, PBD

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)  
(blue LEDs based on novel polymer blend of poly(p-terphenyldiyl-vinylene) and poly(phenylbiphenylsilylene))

IT 146525-78-2

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PRP (Properties); PROC (Process); USES (Uses)

(hole-transporting polymer; blue LEDs based on novel polymer blend of poly(p-terphenyldiyl-vinylene) and poly(phenylbiphenylsilylene))

IT 178561-79-0

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); POF (Polymer in formulation); PRP (Properties); PROC (Process); USES (Uses)

(luminescent polymer; blue LEDs based on novel polymer blend of poly(p-terphenyldiyl-vinylene) and poly(phenylbiphenylsilylene))

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L6 ANSWER 17 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:158364 CAPLUS

DOCUMENT NUMBER: 128:180858

TITLE: Electric field-induced fluorescence quenching and transient fluorescence studies in poly(p-terphenylene vinylene) related polymers

AUTHOR(S): Pfeiffer, N.; Neher, D.; Remmers, M.; Poga, C.; Hopmeier, M.; Mahrt, R.

CORPORATE SOURCE: Max-Planck Institut fur Polymerforschung, Mainz, 55128, Germany

SOURCE: Chemical Physics (1998), 227(1,2), 167-178  
CODEN: CMPHC2; ISSN: 0301-0104

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Elec. field induced fluorescence quenching studies were carried out of a series of poly(p-terphenylene vinylene)s. The quenching efficiency follows a strictly quadratic dependence on the applied field amplitude with maximum values of about 10% at 200 V/ $\mu$ m. Quenching occurs predominantly at higher emission energy, resulting in a distinct blue-shift between the electro-modulated signal and the photoluminescence spectra. These results provide evidence for the field assisted dissociation of neutral excitons within an inhomogeneously broadened d. of states (DOS). Measurements were also carried out of devices prepared by the Langmuir-Blodgett-technique to evaluate component contributions by the Stark effect. These expts. demonstrated the elec. field-assisted separation of charges onto sep. chains. Transient photoluminescence expts. show fluorescence decay times of 100-200 ps. The increase in relaxation time at larger wavelengths, indicates spectral relaxation within the DOS. This leads to a consistent picture, where the balance between elec. field assisted dissociation of excitons competes with the relative decay and the non-radiative decay processes. Implications on the spectral properties of electroluminescent devices are further discussed.

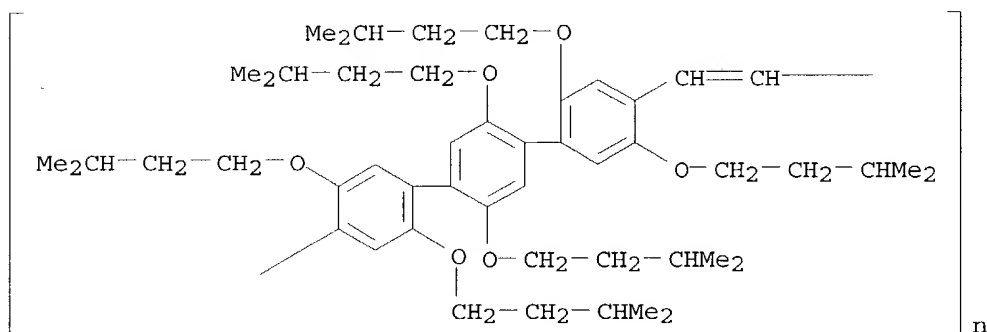
IT 178561-79-0



RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(elec. field-induced fluorescence quenching and exciton dissociation and electronic structure of poly(p-terphenylene vinylene)s)

RN 178561-79-0 CAPLUS

CN Poly[[2,2',2'',5,5',5'''-hexakis(3-methylbutoxy)[1,1':4',1'''-terphenyl]-4,4'''-diyl]-(1E)-1,2-ethenediyl] (9CI) (CA INDEX NAME)



CC 36-5 (Physical Properties of Synthetic High Polymers)

Section cross-reference(s): 74

ST polyterphenylenevinylene conjugated **polymer fluorescence**

quenching; photoluminescence decay PPV Stark effect; exciton dissocn

polyterphenylenevinylene charge sepn chain

IT Polymer chains

(configuration; elec. field-induced fluorescence quenching and exciton dissociation and electronic structure of poly(p-terphenylene vinylene)s)

IT Polymers, properties

RL: DEV (Device component use); PRP (Properties); USES (Uses)

(conjugated; elec. field-induced fluorescence quenching and exciton dissociation and electronic structure of poly(p-terphenylene vinylene)s)

IT Charge separation

Density of states

Electroluminescent devices

Exciton

Fluorescence decay

Fluorescence quenching

Luminescence

Stark effect

(elec. field-induced fluorescence quenching and exciton dissociation and electronic structure of poly(p-terphenylene vinylene)s)

IT Electric current carriers

(generation; elec. field-induced fluorescence quenching and exciton

dissociation and electronic structure of poly(p-terphenylene vinylene)s)

IT Poly(arylenealkenylenes)

RL: DEV (Device component use); PRP (Properties); USES (Uses)

(poly(terphenylene vinylenes); elec. field-induced fluorescence quenching and exciton dissociation and electronic structure of poly(p-terphenylene vinylene)s)

IT 178561-79-0

RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(elec. field-induced fluorescence quenching and exciton dissociation and  
electronic structure of poly(p-terphenylene vinylene)s)

REFERENCE COUNT: 39 THERE ARE 39 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 18 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1997:280116 CAPLUS

DOCUMENT NUMBER: 127:34733

TITLE: Influence of silicon atoms on the  $\pi$ -conjugation in  
**electroluminescent polymers**

AUTHOR(S): Pohl, Anna; Bredas, Jean-Luc

CORPORATE SOURCE: Service Chimie Materiaux Nouveaux, Centre Recherche  
Electronique Photonique Molecularies, Universite  
Mons-Hainaut, Mons, B-7000, Belg.

SOURCE: International Journal of Quantum Chemistry (1997),  
63(2), 437-440

CODEN: IJQCB2; ISSN: 0020-7608

PUBLISHER: Wiley

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The valence effective Hamiltonian method was used to calculate the electronic  
structure for a polymer containing poly(p-phenylenevinylene) and  
dimethoxy-poly(p-phenylene) units as well as silicon atoms used as  
spacers. The equilibrium geometry was obtained by an AM1 calcn. A band gap of  
3.2 eV was obtained, which corresponds to emittance in the blue part of  
the spectrum. This polymer is used as the active layer in light-emitting  
diodes.

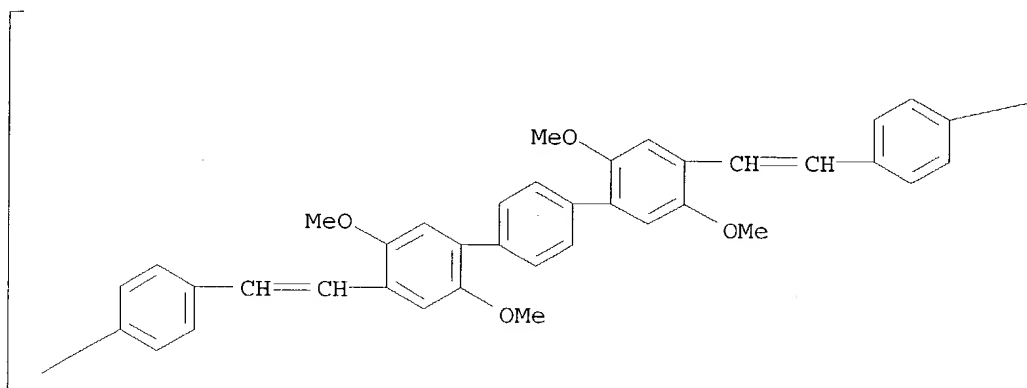
IT 190849-57-1

RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(electronic structure of silicon-containing polymer useful as active layer  
in light-emitting diodes)

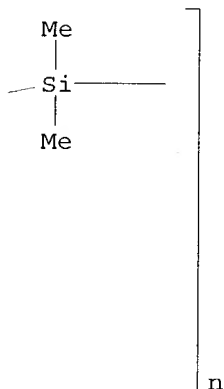
RN 190849-57-1 CAPLUS

CN Poly[(dimethylsilylene)-1,4-phenylene-1,2-ethenediyl(2,2'',5,5''-  
tetramethoxy[1,1':4',1''-terphenyl]-4,4''-diyl)-1,2-ethenediyl-1,4-  
phenylene] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



- CC 36-2 (Physical Properties of Synthetic High Polymers)  
Section cross-reference(s): 73
- ST electronic structure silicon contg polymer; band gap silicon contg polymer; **light emitting diode silicon contg polymer**
- IT Band gap  
Electroluminescent devices  
Electronic structure  
(electronic structure of silicon-containing polymer useful as active layer in light-emitting diodes)
- IT Polycarbosilanes  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(electronic structure of silicon-containing polymer useful as active layer in light-emitting diodes)
- IT **190849-57-1**  
RL: DEV (Device component use); PRP (Properties); USES (Uses)

(electronic structure of silicon-containing polymer useful as active layer in light-emitting diodes)

REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

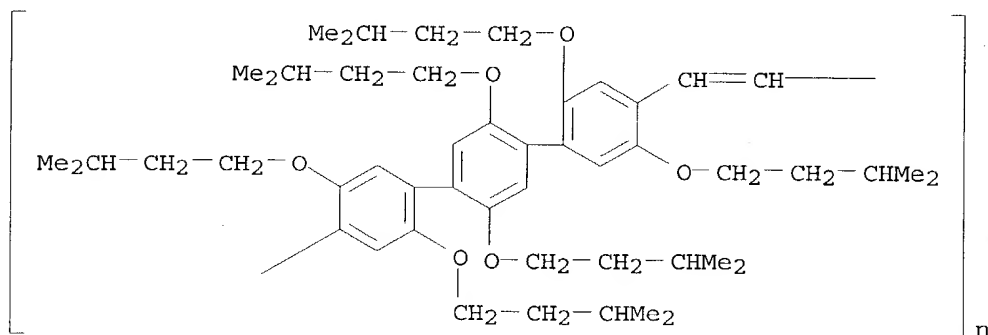
L6 ANSWER 19 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 1997:78654 CAPLUS  
 DOCUMENT NUMBER: 126:132088  
 TITLE: Narrow-band emissions from conjugated-polymer films  
 AUTHOR(S): Gelinck, Gerwin H.; Warman, John M.; Remmers, Marcus; Neher, Dieter  
 CORPORATE SOURCE: IRI, Delft University of Technology, Mekelweg 15, 2629 JB, Delft, Neth.  
 SOURCE: Chemical Physics Letters (1997), 265(3-5), 320-326  
 CODEN: CHPLBC; ISSN: 0009-2614  
 PUBLISHER: Elsevier  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB Narrow optical emission bands (fwhm 5-10 nm) are observed on laser photoexcitation of solid films of certain **fluorescent polymers** composed of phenylene and vinylene or acetylene units. The phenomenon depends strongly on polymer backbone composition and incident light intensity. Possible explanations involving either stimulated emission or exciton condensation are discussed.

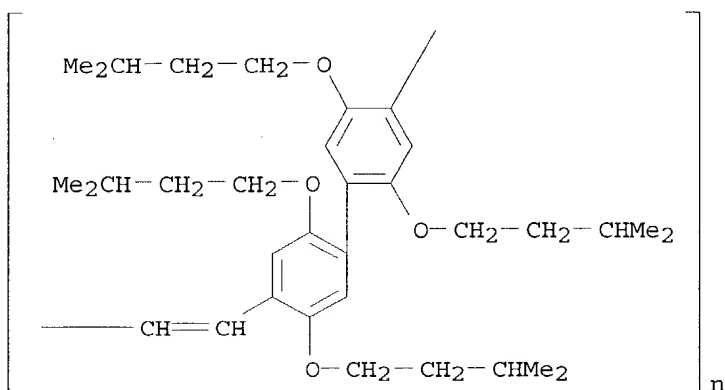
IT 178561-79-0 178561-80-3  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)

(laser-induced optical emissions from films of **fluorescent polymers** composed of phenylene and vinylene or acetylene units)

RN 178561-79-0 CAPLUS  
 CN Poly[[2,2',2'',5,5',5''-hexakis(3-methylbutoxy)[1,1':4',1''-terphenyl]-4,4''-diyl]-(1E)-1,2-ethenediyl] (9CI) (CA INDEX NAME)



RN 178561-80-3 CAPLUS  
 CN Poly[[2,2',5,5'-tetrakis(3-methylbutoxy)[1,1'-biphenyl]-4,4'-diyl]-1,2-ethenediyl], (E)- (9CI) (CA INDEX NAME)



- CC 37-5 (Plastics Manufacture and Processing)
- ST conjugated polymer film optical emission; luminescence laser induced  
polyphenylenevinylene; polyacetylene polyphenyl luminescence laser induced
- IT Fluorescence  
Luminescence  
(laser-induced optical emissions from films of **fluorescent polymers** composed of phenylene and vinylene or acetylene units)
- IT Poly(arylenealkenylenes)  
Polyphenyls  
RL: PEP (Physical, engineering or chemical process); PRP (Properties);  
PROC (Process)  
(laser-induced optical emissions from films of **fluorescent polymers** composed of phenylene and vinylene or acetylene units)
- IT Polyphenyls  
Polyphenyls  
RL: PEP (Physical, engineering or chemical process); PRP (Properties);  
PROC (Process)  
(polyacetylene-; laser-induced optical emissions from films of **fluorescent polymers** composed of phenylene and vinylene or acetylene units)
- IT Polyacetylenes, properties  
Polyacetylenes, properties  
RL: PEP (Physical, engineering or chemical process); PRP (Properties);  
PROC (Process)  
(polyphenyl-; laser-induced optical emissions from films of **fluorescent polymers** composed of phenylene and vinylene or acetylene units)
- IT 156028-51-2 177716-59-5 178561-79-0 178561-80-3  
178561-82-5  
RL: PEP (Physical, engineering or chemical process); PRP (Properties);  
PROC (Process)  
(laser-induced optical emissions from films of **fluorescent polymers** composed of phenylene and vinylene or acetylene units)

L6 ANSWER 20 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 1996:675877 CAPLUS  
DOCUMENT NUMBER: 125:301858

TITLE: Preparation and use of electroluminescent  
oligo(p-phenylenevinylenes)  
INVENTOR(S): Kreuder, Willi; Neher, Dieter; Remmers, Marcus  
PATENT ASSIGNEE(S): Hoechst A.-G., Germany  
SOURCE: Ger. Offen., 11 pp.  
CODEN: GWXXBX  
DOCUMENT TYPE: Patent  
LANGUAGE: German  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 19509451	A1	19960926	DE 1995-19509451	19950320
WO 9629356	A2	19960926	WO 1996-EP1066	19960313
WO 9629356	A3	19970227		
W: CN, JP, KR, US				
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
EP 815156	A2	19980107	EP 1996-907450	19960313
EP 815156	B1	20030709		
R: AT, CH, DE, FR, GB, IT, LI, NL				
CN 1179164	A	19980415	CN 1996-192695	19960313
JP 11502248	T2	19990223	JP 1996-528048	19960313
US 6114490	A	20000905	US 1997-913653	19970918

PRIORITY APPLN. INFO.: DE 1995-19509451 A 19950320  
WO 1996-EP1066 W 19960313

AB The title polymers, with good solubility in organic solvents and giving blue, blue-green, green, and white luminescence, contain p-phenylene and p-phenylenevinylene units of specified structure. Agitating 4,4'-dibromo-2,2',5,5'-tetrakis(isopentyloxy)-trans-stilbene 1.67, 2,5-bis(isopentyloxy)-1,4-benzenediboronic acid 1,3-propanediol diester 1.67, Na<sub>2</sub>CO<sub>3</sub> 20, and Pd(PPh<sub>3</sub>)<sub>4</sub> 0.015 mmol in 50% aqueous THF at 80° for 72 h gave the corresponding oligo(p-phenylenevinylene) with m.p. 210° and repeating unit mol. weight 770. Use of the **polymer** as an **electroluminescent** film is exemplified.

IT 178561-71-2P 178561-79-0P 178561-80-3P  
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(preparation and use of electroluminescent oligo(p-phenylenevinylenes))

RN 178561-71-2 CAPLUS

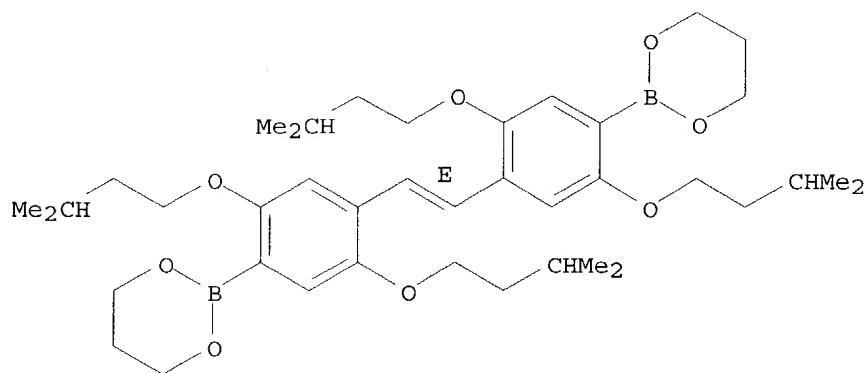
CN 1,3,2-Dioxaborinane, 2,2'-[1,2-ethenediylbis[2,5-bis(3-methylbutoxy)-4,1-phenylene]]bis-, (E)-, polymer with (E)-1,1'-(1,2-ethenediyl)bis[4-bromo-2,5-bis(3-methylbutoxy)benzene] (9CI) (CA INDEX NAME)

CM 1

CRN 178561-65-4

CMF C40 H62 B2 O8

Double bond geometry as shown.

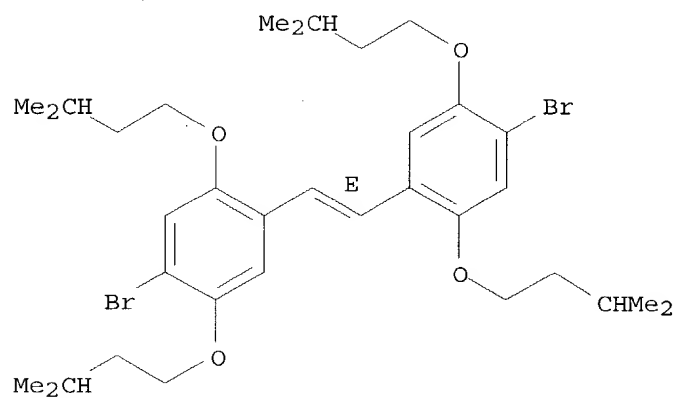


CM 2

CRN 178561-64-3

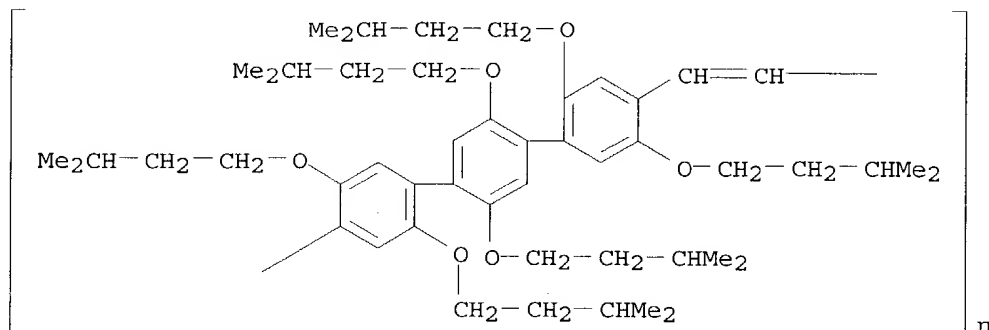
CMF C34 H50 Br2 O4

Double bond geometry as shown.



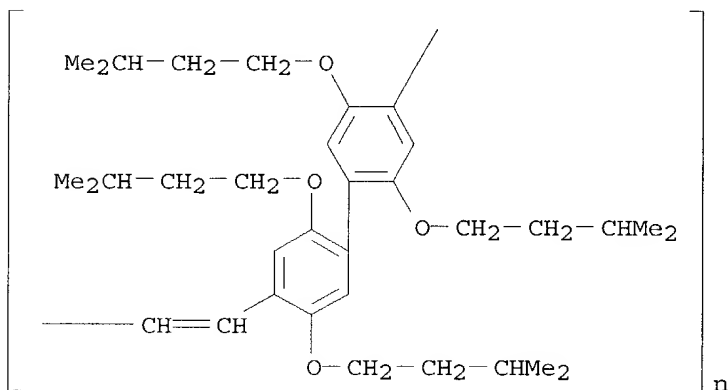
RN 178561-79-0 CAPLUS

CN Poly[[2,2',2'',5,5',5''-hexakis(3-methylbutoxy)[1,1':4',1''-terphenyl]-4,4''-diyl]-(1E)-1,2-ethenediyl] (9CI) (CA INDEX NAME)



RN 178561-80-3 CAPLUS

CN Poly[[2,2',5,5'-tetrakis(3-methylbutoxy)[1,1'-biphenyl]-4,4'-diyl]-1,2-ethenediyl], (E)- (9CI) (CA INDEX NAME)



IC ICM C08G061-02

ICS C08G081-00; C09K011-06; H05B033-14

ICA C07C025-02; C07C025-18; C07C025-24; C07F005-04; C07F005-05; C07C043-225; C07C323-09; C07C317-32; C07C069-773

CC 35-5 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 74

ST polyphenylenevinylene oligomer electroluminescent;  
dibromobisisopentyloxystilbene copolymer electroluminescent;  
benzenediboronate bisisopentyloxy copolymer electroluminescent

IT Phosphors

(electroluminescent, preparation and use of electroluminescent  
oligo(p-phenylenevinylenes))

IT Poly(arylenealkenylenes)

RL: IMF (Industrial manufacture); TEM (Technical or engineered material  
use); PREP (Preparation); USES (Uses)

(polyphenylenevinylenes, oligomeric; preparation and use of  
electroluminescent oligo(p-phenylenevinylenes))

IT 178561-70-1P 178561-71-2P 178561-79-0P



178561-80-3P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(preparation and use of electroluminescent oligo(p-phenylenevinylenes))

L6 ANSWER 21 OF 21 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1996:622973 CAPLUS

DOCUMENT NUMBER: 125:248998

TITLE: The Optical, Electronic, and Electroluminescent Properties of Novel Poly(p-phenylene)-Related Polymers

AUTHOR(S): Remmers, Marcus; Neher, Dieter; Gruener, Johannes; Friend, Richard H.; Gelinck, Gerwin H.; Warman, John M.; Quattrocchi, Calogero; dos Santos, Doni A.; Bredas, Jean-Luc

CORPORATE SOURCE: Max-Planck-Institut fuer Polymerforschung, Mainz, D-55021, Germany

SOURCE: Macromolecules (1996), 29(23), 7432-7445

CODEN: MAMOBX; ISSN: 0024-9297

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A variety of novel, soluble, conjugated poly(p-phenylene)- (PPP) and poly(p-phenylenevinylene) (PPV)-related polymers have been synthesized using a synthetic approach that allows for the tailoring of the chemical structure of the polymer backbone. The polymers contain 1-5 sequential 2,5-isoamylxy-1,4-phenylene units connected by ethynylene, ethenylene, and/or ethanediyl units. The absorption and emission properties of the materials can be tuned over a wide range of the visible spectrum. The materials were characterized in terms of mol. weight and phase behavior. The localization of the energy levels of the polymers has been determined with quantum mech. calcns. and exptl. with optical methods and cyclovoltametry. The mobilities of charge carriers measured in the microwave conductivity experiment

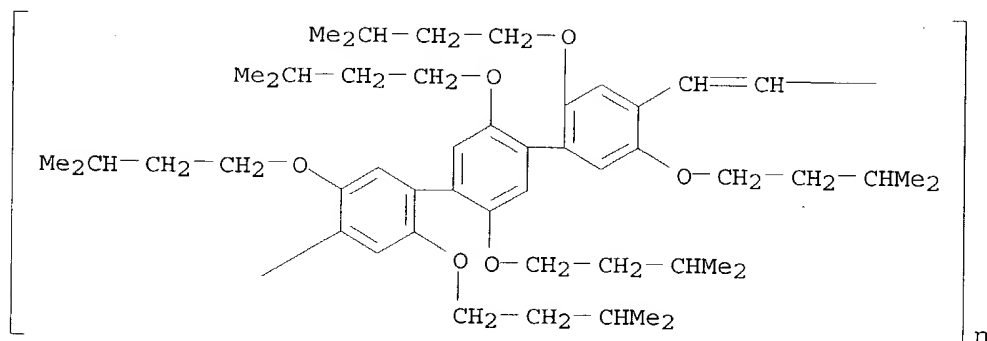
are on the order of  $10^{-7}$  m<sup>2</sup>/(V.s) with an activation energy of ca. 0.06 eV. Photoluminescence (PL) quantum yields in solution are generally higher than 60%; in the solid state values even of up to 73% are observed. If the conjugation is interrupted every tenth Ph unit, mobilities are reduced by a factor of about 2 and PL efficiencies are significantly increased. A range of electroluminescent devices partly containing addnl. electron- and hole-transporting layers were also investigated. We obtain internal EL efficiencies of up to 4% in the blue region.

IT 178561-79-0 178561-80-3 181865-03-2

RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(optical, electronic, and electroluminescent properties of novel poly(p-phenylene)-related polymers)

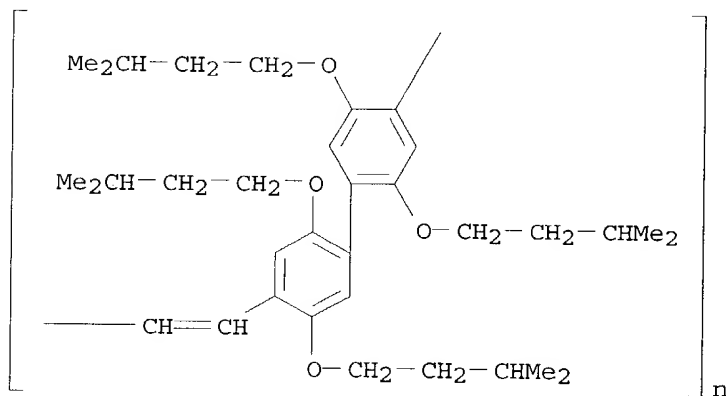
RN 178561-79-0 CAPLUS

CN Poly[[2,2',2'',5,5',5''-hexakis(3-methylbutoxy)[1,1':4',1''-terphenyl]-4,4''-diyl]-(1E)-1,2-ethenediyl] (9CI) (CA INDEX NAME)



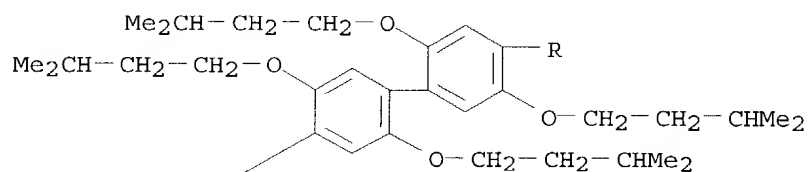
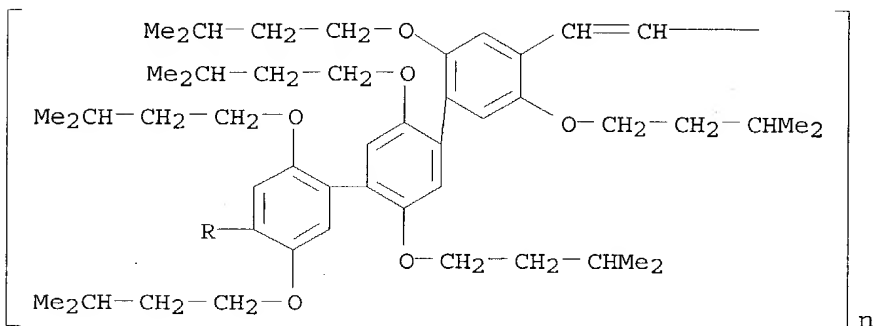
RN 178561-80-3 CAPLUS

CN Poly[[2,2',5,5'-tetrakis(3-methylbutoxy)[1,1'-biphenyl]-4,4'-diyl]-1,2-ethenediyl], (E) - (9CI) (CA INDEX NAME)



RN 181865-03-2 CAPLUS

CN Poly[[2,2',2'',2''',2'''',5,5',5'',5''',5''''-decakis(3-methylbutoxy)[1,1':4',1'':4'',1''':4''',1''''-quinquephenyl]-4,4''''-diyl]-1,2-ethenediyl], (E) - (9CI) (CA INDEX NAME)



- CC 36-5 (Physical Properties of Synthetic High Polymers)  
Section cross-reference(s): 38, 73, 74, 76
- ST polyacetylene polyphenylene polyvinylene optical electronic property;  
light emitting diode polyacetylene polyphenylene polyvinylene;  
electroluminescent property polyacetylene polyphenylene polyvinylene; liq  
cryst polyacetylene polyphenylene polyvinylene; MO AM1 polyacetylene  
polyphenylene polyvinylene; microwave cond polyacetylene polyphenylene  
polyvinylene; bandgap polyacetylene polyphenylene polyvinylene; color  
turnability polyacetylene polyphenylene polyvinylene diode
- IT Exciton  
(confinement and mobility of; optical, electronic, and  
electroluminescent properties of novel poly(p-phenylene)-related  
polymers)
- IT Electric current carriers  
(mobility of; optical, electronic, and electroluminescent properties of  
novel poly(p-phenylene)-related polymers)
- IT Electric current-potential relationship  
Electroluminescent devices  
Electron affinity  
Glass temperature and transition  
Ionization potential and energy  
Liquid crystals, **polymeric**  
Luminescence  
Luminescence, electro-  
Microwave  
Ultraviolet and visible spectra  
(optical, electronic, and **electroluminescent** properties of  
novel poly(p-phenylene)-related polymers)
- IT Poly(arylenealkenylenes)  
Polyphenyls

- RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(optical, electronic, and electroluminescent properties of novel poly(p-phenylene)-related polymers)
- IT Molecular orbital  
(AM1, optical, electronic, and electroluminescent properties of novel poly(p-phenylene)-related polymers)
- IT Molecular orbital  
(HOMO, optical, electronic, and electroluminescent properties of novel poly(p-phenylene)-related polymers)
- IT Polyacetylenes, properties  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(Ph group-containing, optical, electronic, and electroluminescent properties of novel poly(p-phenylene)-related polymers)
- IT Energy level, band structure  
(gap, optical, electronic, and electroluminescent properties of novel poly(p-phenylene)-related polymers)
- IT Polyacetylenes, properties  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(polyphenylenevinylene-, optical, electronic, and electroluminescent properties of novel poly(p-phenylene)-related polymers)
- IT Poly(arylenealkenylenes)  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(polyphenylenevinylenes, optical, electronic, and electroluminescent properties of novel poly(p-phenylene)-related polymers)
- IT Poly(arylenealkenylenes)  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(polyphenylenevinylenes, polyacetylene-, optical, electronic, and electroluminescent properties of novel poly(p-phenylene)-related polymers)
- IT 7440-70-2, Calcium, uses  
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
(light-emitting diode, counter electrode, Al-protected; optical, electronic, and electroluminescent properties of novel poly(p-phenylene)-related polymers)
- IT 9011-14-7, Poly(methyl methacrylate)  
RL: DEV (Device component use); POF (Polymer in formulation); USES (Uses)  
(light-emitting diode, electron transport layer matrix; optical, electronic, and electroluminescent properties of novel poly(p-phenylene)-related polymers)
- IT 15082-28-7  
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
(light-emitting diode, electron transport layer; optical, electronic, and electroluminescent properties of novel poly(p-phenylene)-related polymers)
- IT 25067-59-8, Poly(vinylcarbazole)  
RL: DEV (Device component use); USES (Uses)  
(light-emitting diode, hole transport layer; optical, electronic, and electroluminescent properties of novel poly(p-phenylene)-related polymers)
- IT 50926-11-9, Indium tin oxide

RL: DEV (Device component use); USES (Uses)  
(light-emitting diode, transparent metal layer; optical, electronic,  
and electroluminescent properties of novel poly(p-phenylene)-related  
polymers)

IT 156028-51-2 178561-79-0 178561-80-3 178561-82-5  
181865-03-2

RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(optical, electronic, and electroluminescent properties of novel  
poly(p-phenylene)-related polymers)

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